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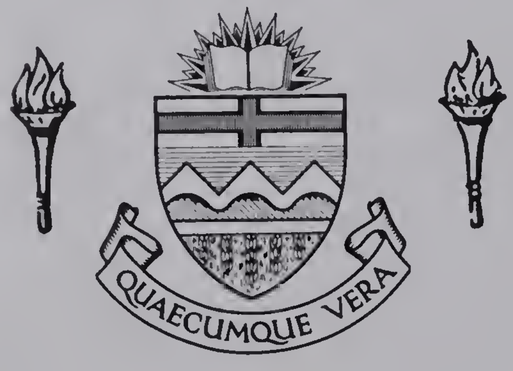

THE UNIVERSITY OF ALBERTA

A STUDY OF THE RELATIONSHIP BETWEEN SELECTED CHARACTERISTICS AND THE INNOVATIVENESS OF JUNIOR HIGH SCHOOL TEACHERS

by

©

MICHAEL PETER YAKIMISHYN

A THESIS
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Study of the Relationship Between Selected Characteristics and the Innovativeness of Junior High School Teachers" submitted by Michael Peter Yakimishyn in partial fulfillment of the requirements for the degree of Master of Education.

ABSTRACT

The purpose of this study was to determine whether a relationship exists between the instructional innovativeness of junior high school teachers and the personal, situational, and professional characteristics of these teachers.

Data for the study were obtained from 326 junior high school teachers teaching during the 1966-67 school year in elementary-junior high schools and junior high schools in metropolitan Winnipeg, Manitoba.

The instructional innovativeness of teachers was measured by four adoption sub-scales and a Total Adoption Scale developed especially for this study. The four sub-scales, namely, Instructional Aids (I_1) which measures the extent of adoption of instructional aids, Technical and Professional Assistants (I_2) which assesses the extent of adoption of technical and professional personnel to assist instruction, Instructional Planning and Organizing Practices (I_3) which measures the extent of adoption of practices designed to assist in planning and organizing for instruction, and Individualizing Instruction (I_4) which measures the extent of adoption of practices which focus on individual differences of students, were employed to obtain measures of specific types of instructional innovativeness. The Total Adoption Scale (I_5) purports to be a measure of

the general instructional innovativeness of each teacher.

Significant differences in instructional innovativeness were found when teachers were classified according to selected personal factors. Male teachers scored higher in innovativeness than female teachers on I_1 and I_3. The 26-40 age category was more innovative than the 41 or more age category on I_1, I_3 and I_5. The 7-17 years of experience category was more innovative than the 18 or more years of experience category on I_1, I_3 and I_5.

Teachers classified according to selected situational factors were found to differ significantly in innovativeness. Teachers teaching in junior high schools were more innovative than teachers teaching in elementary-junior high schools on I_1, I_4 and I_5.

Several professional factors were found to be related to innovativeness. On I_1, I_3 and I_5 the teacher group with 3-5 years of post-secondary education was more innovative than the group with 6 or more years. On I_3, I_4 and I_5 the subject area association member category was more innovative than the non-member category.

From the results of the analyses it was concluded that personal factors, namely, age and teaching experience, one situational factor, namely, type of school, and the professional factors, namely, post-secondary education and subject area association membership, were teacher characteristics related to instructional innovativeness.

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CHAPTER I

DEFINITION OF THE PROBLEM

One of the relatively stable characteristics of society has been its rapid rate of change (6, p. 42). Numerous writers, for example Goslin (6, pp. 42-62), Grambs (7, p. 11), and Pellegrin (4, p. 65), have indicated technological change, automation, bureaucratization, specialization, unemployment, urbanization, the population explosion and the exploding nature of knowledge as some of the most important areas of change in society. Each of these areas constitutes a source of pressure for change in education. But perhaps the one single source of pressure which appeared to accelerate educational innovation occurred in the area of international tensions. A study of instructional changes that occurred in the New York State Schools between 1953 and 1960 revealed that the rate of instructional innovation "more than doubled within 15 months after the firing of the Soviet Sputnik I on October 4, 1957" (2, p. 18).

Despite developments of this nature which demand adaptive changes in educational organization and practice, many observers, for example Mort (14, p. 318), and Rogers (18, p. 39), indicate that change at the public school level is a painfully slow process. This viewpoint is

supported by Grambs who also notes the conservatism of schools and teachers (7, p. 8). To gain insight into the seemingly slow process of change in education, Rogers points out that researchers at Columbia University Teachers College carried out the majority of studies investigating the factors related to innovativeness. In almost all of the investigations undertaken by researchers at that institution the studies focused on the school system as the unit of analysis (18, pp. 39-40). Furthermore, Carlson notes that each of these studies was characterized by the "assumption that characteristics of chief school officials are unimportant in explaining rates of adoption of innovations" (4, p. 7). More recently several studies investigating educational innovations have focused on the individual as a unit of analysis. For example, Carlson's (3) study dealt with the characteristics of innovative superintendents; Marion (15) and Holdaway (9) focused on the characteristics of the innovative elementary school principal. There is, however, a paucity of research on the characteristics of innovative classroom teachers.

The present study will, therefore, focus on selected characteristics of classroom teachers to determine whether or not there is a relationship between these characteristics and the innovativeness of teachers.

I. THE PROBLEM

Statement of the Problem

The purpose of this study is to determine whether a relationship exists between the instructional innovativeness of junior high school teachers and certain characteristics of these teachers.

Importance of the Study

In the context of increasing rates of change, school administrators' activities are of a dual nature. Ingram notes that administrators must keep their "organization functioning smoothly, effectively and efficiently, and, at the same time, they must constantly adapt the objectives, the services, the facilities, and the structure of their organizations to meet new conditions and new needs" (11, p. 33).

Despite the fact that the school administrator has been cast in the role of innovator by some researchers, the organization in which he serves is far too complex for him to be totally effective in modifying instructional practices. Hayes concludes the school administrator is not running a one-man show; he is part of a system of persons, both inside and outside the organization (8, p. 47). Teachers represent an element which is internal to the system. The importance of this element in educational

change is pointed out by Arnett: "Our schools are going to change and teachers are going to be in the middle of that change--a key factor in it" (1, p. 30).

In spite of the importance of the teachers' role in instructional innovation there is a notable lack of study in this respect. According to Rogers:

> Few studies have been completed with teachers (only one such study was encountered in a search of the literature) as the unit of adoption, and only one study of school superintendents, in spite of their importance in school adoption decisions (4, p. 60).

As a result there is a dearth of reliable knowledge pertaining to the teacher element and innovation. School administrators, however, need information of this nature to guide their decision-making concerning change. Morris contends:

> A strategy for innovation is, in essence, a strategy of decision-making. Decision-making lies at the very core of innovation and is essential to the rational strategy for moving innovation from idea to reality, from paper to people. . . . As decision-making is basically the making of choices among alternatives, sound procedures for making such choices are necessary (16, pp. 22-23).

In addition Pellegrin indicates:

> There remain serious and complex problems concerning the nature of the changes that should be introduced, the method and timing of their introduction and so on. In order to cope with such problems we need much reliable knowledge we do not presently have (4, p. 65).

This viewpoint is more specifically reinforced by Miller. He claims there is a lack of knowledge concerning

the change role of classroom teachers. In Miller's words, "This important area for study remains largely untapped by researchers in the dynamics of change" (15, p. 360).

Similarly Eboch also notices a notable lack of research on the classroom teacher's role in the implementation of innovation (5, p. 36). According to Ingram, teachers at the classroom level are a key factor in innovation. Ingram states:

> It is at this level that change or lack of it, has its real effect. Regardless of what alterations may be made at the provincial, system or school levels, innovations will not be made in instruction until and unless the teacher changes (10, p. 17).

The importance and need for research in this area is suggested in the observation made by Grambs who notes that "educational specialists working with teachers testify to the great difficulty encountered with very many in trying to induce changes" (7, p. 161).

The importance of the teacher element in instructional innovation and the lack of information about the relationship of these two factors, innovation and the teacher, strongly suggests the necessity for research in this area. It is hoped that this study will provide the needed constituent to research into innovation at the classroom level. It might assist in clarifying why some teachers are more innovative than others. Furthermore, it might provide guidelines to those who are cast in the

role of "change agents."

In conclusion, then, this study may be of value to school administrators, teachers' professional organizations, Departments of Education, teacher-education institutions and school boards in assisting them in their efforts to hasten change. More specifically it may be helpful in the following situations:

1. School administrators may be assisted in planning in-service education programs, orientation programs and the placement of teachers.

2. Teachers' professional organizations may use the findings to assist in the planning of "professional" development activities such as workshops, clinics and seminars aimed at assisting teachers to cope with the problems of educational change.

3. Teacher-education institutions may find the study helpful to plan for those experiences which develop skills and attitudes in prospective teachers considered desirable to meet the challenge of instructional innovation.

II. DEFINITIONS OF TERMS USED

An Instructional Innovation. Rogers defines an innovation as "any element or idea perceived as new by the individual" (18, p. 13). For this study the innovations selected were those perceived as new by school principals

in junior high schools and elementary-junior high schools.

The innovations in this study will be referred to as instructional innovations. Instructional innovations will include those instructional services and instructional practices which the teacher is usually free to use in his classroom instruction or to assist classroom instruction.

Adoption. Rogers defines adoption as a decision to continue full use of an innovation (18, p. 17). For this study adoption means the decision or action to use an instructional innovation according to the conditions stated in the instrument measuring the adoption of instructional innovations. Adoption in this case is an individual matter.

Innovativeness. The innovativeness of a teacher is used to refer to the number of innovations adopted by that teacher, as compared with the number adopted by other teachers. This number takes into consideration the availability of instructional innovations for adoption or rejection.

Innovativeness Ratio. The innovativeness ratio refers to the ratio of the number of instructional innovations the individual teacher adopted to the number of instructional innovations that were available to him for adoption. There are five separate and distinct innovativeness ratios, I_1, I_2, I_3, I_4 and I_5. The first four ratios are obtained from the sub-scales which compose the adoption

scale. I_5 refers to the innovativeness ratio for a particular teacher and is a ratio derived from the entire adoption scale.

Professional Attitude. Thurstone refers to "attitude" as a concept denoting "the sum total of a man's inclination and feelings, prejudice or bias, preconceived notions, ideas, fears, threats and convictions about any specified topic" (19, p. 216). Remmers and Gage suggest that "attitudes may be roughly defined as feelings for or against something" (17, p. 361). For this study "professional" attitudes will refer to attitudes toward policies advocated by the Manitoba Teachers' Society and believed by the society to be appropriate for teachers in the province of Manitoba.

Social Category. Such social characteristics as age, sex and marital status are examples of social categories. Social categories differ from social groups in that there may be little interaction between the occupants of the established statuses in a social category (13, p. 299), whereas the concept of group typically implies face-to-face interaction.

Social Status. Rogers defines social status as an indication of one's position in the social structure (18, p. 290). Carlson also attaches the same meaning to status (3, p. 24). In other words, "Status makes reference to a person's rank or position along some continuum" (3, p. 24).

In this study four distinct dimensions of teacher status are considered. These include: (1) the number of years of post-secondary education, (2) the recency of in-service education, (3) professional participation--which focuses on the quality and quantity of participation in selected activities of a teachers' organization and (4) professional teacher attitudes.

Cosmopoliteness. This term refers to "the degree to which an individual's orientation is external to a particular social system" (18, p. 17). In the present study cosmopoliteness is defined as a teacher's membership in a subject area association. Membership suggests that a teacher has interests outside the local school system.

III. THE SUB-PROBLEMS

The sub-problems arising from the major problem include the following:

1. What relationship exists between selected social categories of junior high school teachers and their innovativeness?

2. What relationship exists between number of years of post-secondary education of junior high school teachers and their innovativeness?

3. What relationship exists between length of teaching experience and the innovativeness of junior high school teachers?

4. What relationship exists between participation in teachers' organization activities and the innovativeness of junior high school teachers?

5. What relationship exists between the "professional" attitudes expressed by junior high school teachers and their innovativeness?

6. Which of these variables, sex, marital status, age, education, teaching experience, participation in teachers' organization activities, subject specialization, recency of in-service education and "professional" attitudes account for the greatest percentage of the variance in teachers' innovativeness ratios?

IV. ASSUMPTIONS

1. It was assumed that the instruments used produced valid and reliable measures of the concepts being measured.

2. It was assumed that the questionnaire method of identifying instructional innovations is valid and reliable.

V. LIMITATIONS

The researcher is cognizant of the following limitation of this study:

1. It is realized that one methodological difficulty in this study related to differences between

respondents in their ability to recall accurately whether adoption met the conditions set out in the instrument.

VI. DELIMITATION

1. The unit of adoption examined in this study is the individual teacher and not the school or school system in which he teaches.

2. The study is further delimited to junior high school teachers (grades VII, VIII and IX) who teach in schools classified as junior high schools or elementary-junior high schools.

3. The study included only those junior high school teachers who voluntarily supplied the data requested. This study excluded the principals and vice-principals of the schools under study.

4. A further delimitation in the study concerns the instructional innovations selected for this study. The instructional innovations were limited to those which individual teachers were free to adopt without having to take into consideration major budgetary limitations or administrative approval.

5. Finally the study is limited to teachers in schools where the principals expressed a willingness to participate in the project.

VII. OVERVIEW OF THE REPORT

In the first chapter the problem was outlined and arguments were advanced to establish the significance of the study. Chapter II deals with the development of a conceptual framework for the study. In Chapter III the review of the literature and research is reported and from this evidence the hypotheses are developed. Chapter IV deals with the description of the methodology and instrumentation. In Chapter V data concerning the description of the sample, the extent of adoption of innovations and the correlation between various variables are presented. In Chapters VI and VII the findings of the study are reported. The final chapter, Chapter VIII, presents a summary, and conclusion and implications of the study.

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CHAPTER II

THE CONCEPTUAL FRAMEWORK

I. INTRODUCTION

Two main approaches to adoption studies have been taken in social science investigations: the social psychological, emphasizing the decision-making aspect of adoption; and the sociological, concentrating on change, especially on the diffusion process (17, p. 35). These two processes, diffusion and adoption, which bring new ideas from their source of initial development to final acceptance are interrelated but differ in certain respects.

Difference Between Diffusion and Adoption

Diffusion refers to the spread of new ideas from the originating source to the ultimate adopter. Gross describes this phenomenon as an "interactive process" by which certain members of the social system who have adopted, influence others to adopt (20, p. 23). In this respect diffusion is related to an individual's differential position in the social system which controls both the access to and the acceptance of external influences arising outside the group.

The adoption process differs from diffusion. Diffusion is an occurrence between people whereas adoption is

primarily an individual matter. In essence, adoption involves a decision to accept an innovation, and such a decision reflects the individual's characteristics, needs, orientation, knowledge, and the influences operational at the time of the decision. In decision-making, the benefits and consequences of several alternatives are considered before a decision is reached.

In general, according to Wilkening, these two processes, diffusion and adoption, have been conceptually defined as being respectively analogous to (1) a communication network and (2) decision-making (22).

The present study concerns itself with the latter process, namely, adoption, and examines whether there exists a relationship between the adoption of selected instructional innovations by junior high school teachers and certain characteristics of these teachers.

II. THE TEACHER AND THE ADOPTION PROCESS

Like Wilkening (22) and Mort (15, pp. 317-318), Rogers also sees the adoption process as being analogous to decision-making. The theoretical approach to the adoption process, taken by Rogers, is one which views this phenomenon as a special type of decision-making (19, p. 78).

Generally speaking, educators accept this viewpoint. Recently the Project on Instruction, a study of the National Education Association concerned with educational

innovation, identified two major decision areas--deciding what to teach and planning and organizing for teaching (16, p. 7).

Decisions about what to teach, how to teach, and how to organize for teaching are made daily in these two decision areas. The decisions that affect the instructional program are made at three levels of remoteness from the student (16, pp. 7-8). According to Sand, these three levels may be classified in the following manner:

> Close to the students, teachers make daily instructional decisions. At a more remote level, teachers and administrators make institutional decisions. At a still more remote level, school board members, state legislatures and federal officials make societal educational decisions (16, p. 8).

Brickell has used a similar classification of decision levels concerned with educational change. According to Brickell, decisions concerning structural innovation in the public school might be influenced from two distinct levels. These two levels consist of: (1) the public, which is external to the institution, and (2) the profession, which is internal to it (2, p. 19).

Brickell recognizes the importance of the teacher in the change process. He claims that as long as the teacher "remains inside his classroom he exerts almost total control" of the decision to adopt or reject instructional innovations. This level of influence may be referred to as the classroom level. At the classroom

level the teacher can make three types of instructional change in the absence of administrative initiative (2, pp. 22-23). Two of these types of innovations, change in classroom practice and relocation of existing curriculum content, may be carried out by most teachers.

Brickell and Sand's position is consistent with Etzioni's view. Etzioni contends that:

> In professional organizations administrators are in charge of secondary activities; they administer means to the major activity carried out by professionals . . . administrators offer advice about the economic and organizational implications of various activities planned by professionals. The final decision is, functionally speaking, in the hands of various professionals and their decision-making bodies (7, p. 81).

The position taken by Ingram also agrees with the opinions of these authorities. Ingram maintains the decision-makers at the classroom level, the teachers, are in the crucial positions regarding instructional innovations. He indicates the importance of the teacher's role in the adoption process by stating, "It is at this level that change, or lack of it, has its real effect" (10, pp. 16-17). Regardless of what innovations are made at the provincial, system or school levels, innovations at the instructional or classroom level are the ones of major consequence.

Rogers and Eichholz focus attention directly on the importance of the individual in adopting instructional innovations. They maintain that when the institution is

used as the unit of analysis much of the individual variation in innovativeness and other variables is cancelled (15, p. 314). This has been adequately illustrated by Carlson's study. Carlson explored the effect of the superintendent of schools in the adoption process. The characteristics of the individual superintendent which Carlson used accounted for 64.2 per cent of the variability in adoption in the Allegheny County Study and 82.4 per cent of the variability in the West Virginia Study (3, pp. 56-60).

This appears to sum up effectively why studies which focus on the individual's characteristics are of considerable, and, possibly, of vital importance in explaining variation in the adoption of instructional innovations.

III. ROGERS' THEORY OF ADOPTION

A theory developed by Rogers (19) has been employed to provide a general framework for the present study. Rogers claims the model he outlined may guide research and may enhance the prediction of innovative behavior (19, p. 307). Nevertheless, he cautions that his model

> . . . is not presented as _the_ theory of adoption or as the only theory that may be advanced. Instead, it is a summary of current research and theory that has been reported in the fields of social psychology, cultural anthropology, sociological theory, and the traditions of diffusion research (19, p. 307).

Ingram supports the use of Rogers' "adoption process" theory for investigations in education. He maintains that this theory is more solidly based upon empirical studies than are most of the other popular theories. In addition, Ingram points out that "most of Rogers' concepts come from his examination of over five hundred studies of innovations in agriculture, medicine and education" (11, p. 38).

In general, it was felt that Rogers' theoretical model provides one of the better frameworks for investigating the correlates of instructional innovativeness. Also, because this theory has roots in studies of innovation in education as well as agriculture and medicine, it was thought appropriate as a theoretical base for the present study. A summary of Rogers' adoption theory follows.

Rogers' adoption theory is considered below under four sub-topics: (1) the processes through which the individuals pass in adopting an innovation, (2) the variables which influence an individual as he goes through the adoption process, (3) the adopter categories, and (4) the characteristics of individuals based on the rate at which they adopt innovations. Although this study will not investigate the first two aspects, a brief discussion of these is necessary in order to relate the generalizations of the third and fourth sub-topics--categories and characteristics.

The Adoption Process

Rogers states, "The adoption process is one type of decision-making" (19, p. 77). March and Simon have also recognized this similarity. They claim:

> The innovative processes . . . are closely related to the various intellective processes, referred to by psychologists as "problem-solving," "productive thinking," "creative thinking," "invention," and the like (15, p. 177).

Rogers defines this adoption process as "the mental process through which an individual passes from first hearing about an innovation to final adoption" (19, p. 76). In the same way that decision-making is a process involving a sequence of stages with a different type of activity occurring during each stage, likewise, the individual in adopting a new practice goes through a process involving stages.

Rogers identifies five stages in the process: awareness, interest, evaluation, trial and adoption. These five stages are not necessarily a rigid pattern which the individual follows, nor a set of exclusive and discrete categories with no overlap. Rather these stages represent five sequences that can be clearly identified very frequently by researchers (12, p. 4).

This series of distinguishable stages is described in the following manner.

Awareness stage. During the awareness stage the individual is exposed to a new practice but lacks adequate

or complete information about it. In addition, the individual has not yet received the motivation to expend energy and seek further information at this stage. For instance, a teacher may have heard about team teaching but he lacks the motivation and adequate information in this respect.

Interest stage. From the awareness stage the individual advances to the interest stage. He develops an interest in the innovation, becomes motivated and seeks out additional information about it. In the case of team teaching he would want to know more about it --- how is it initiated, what demands are made on the teacher's time?

Evaluation stage. During the evaluation stage, the individual makes a mental assessment and application of the innovation to his situation. The individual decides to try, drop or consider further the innovation in this stage of the process.

Trial stage. If the decision is to accept the new practice, the individual adopter tries the new practice, usually, on a small scale and on an experimental basis. If the small scale experiment proves successful he may make extensive use of the innovation. In this manner the trial stage reduces the risks which accompany change. Most individuals use the trial stage to make judgment on further use. Thus the results during the trial stage are extremely important in the adoption-rejection decision.

Adoption stage. During the adoption stage the

individual decides to make full scale and continued use of the innovation. The stage functions as an evaluation stage for the trial results. For example, the teacher who has tried out team teaching will use the trial results to base his decision as to whether or not he should use the new practice with all his classes and on a continued basis.

Discontinuance

The decision sequence, however, can be truncated at any point or stage. In Rogers' words, "An innovation may be rejected at any stage in the adoption process. Rejection is a decision not to adopt an innovation" (19, p. 88).

Rejection which occurs after adoption is referred to as a "discontinuance". More precisely a discontinuance is a decision to curtail use of an innovation which had been adopted.

Variables Influencing the Adoption Process

Many variables influence an individual as he passes through the five-stage adoption sequence. In general, these influences which affect the decision by an individual to adopt or reject an innovation are of three types or sets. One set stems from the individual himself--the antecedents or "those factors present in the situation prior to the introduction of an innovation" (19, p. 305). A second set of influences involves the information sources available to or used by the individual. Finally

the third set of influences centers on the characteristics of the innovation as perceived by the individual. These variables are illustrated in the paradigm depicting the major aspects of the adoption process theory (see figure 1, p. 25).

Antecedents. The antecedents consist of two major types: (1) the actor's identity or personal factors, and (2) his perceptions of the situation.

The actor's own identity includes his own feeling of security or anxiety, his values, his social status, his cosmopoliteness, along with other variables. The second type of antecedent which influences his adoption behavior is the individual's perception of the situation. This includes his social system's norms on innovations and his perception of the characteristics of the group to which he belongs.

These antecedents, the personal and situational factors, both influence the individual's decision to adopt or reject an innovation.

Information sources. The information sources provide the individual with stimuli in the adoption process. These information sources may be classed in two categories: (1) either a cosmopolitan or local information source, and (2) either a personal or impersonal source. Thus an information source which is external to an individual's group is cosmopolite. If, on the other hand, the source is

PARADIGM OF THE ADOPTION OF AN INNOVATION BY AN INDIVIDUAL

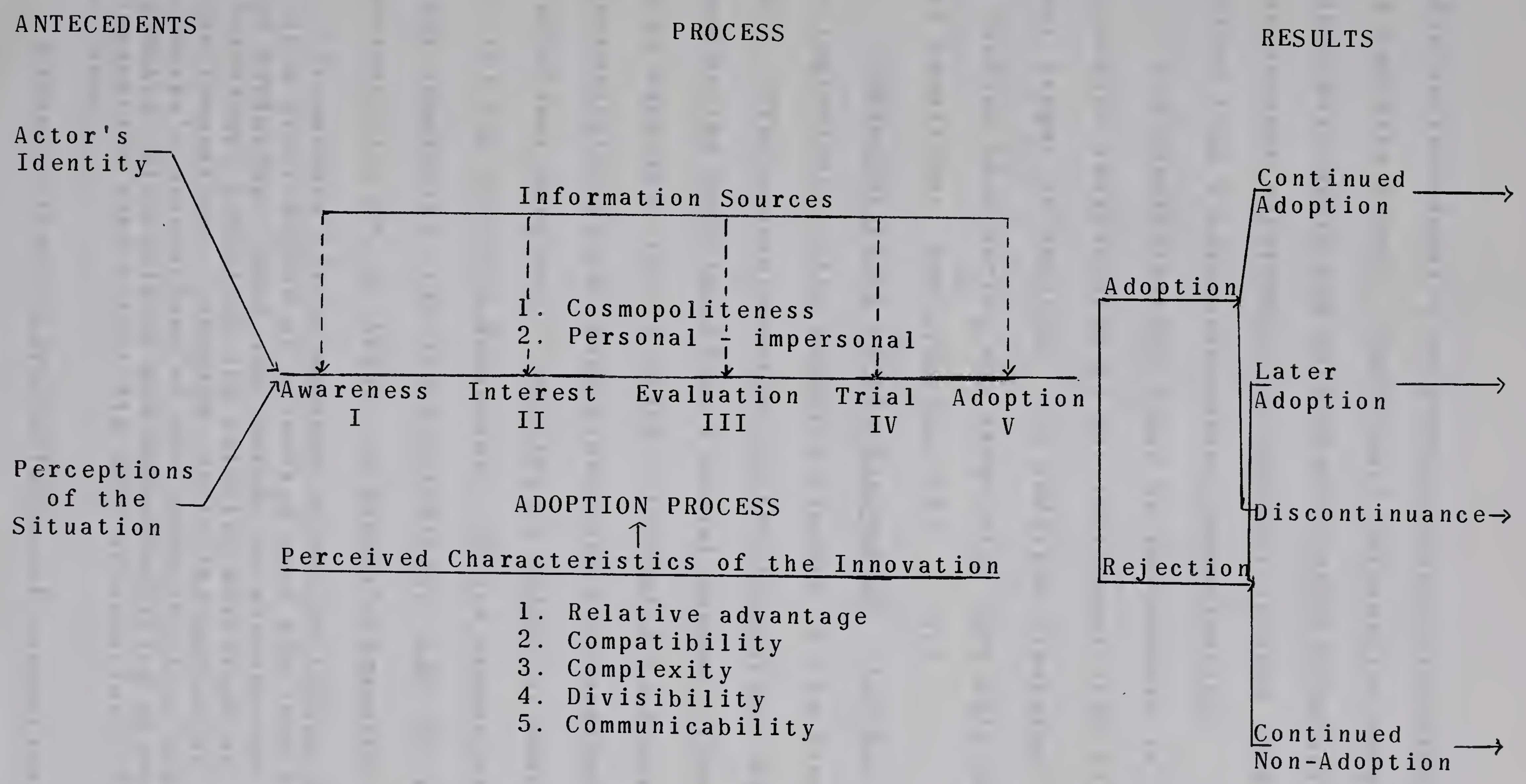

FIGURE I

Source: E.M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 306.

within an individual's reference group it is referred to as a localite source. Impersonal information sources include mass media and published or printed material. Those sources referred to as personal include information received from a person-to-person communication.

One generalization drawn by researchers is that the information sources used by the individual vary with different stages of adoption. In addition Lionberger claims the sources used during any stage also vary with persons, local conditions, and practices (12, p. 31).

Characteristics of the Innovation. Another important ingredient in the adoption process is the innovation itself. "The characteristics of the innovation, as perceived by the individuals in a social system, affect its rate of adoption" (19, p. 146). According to Rogers, the characteristics of an innovation which are considered by an individual when he is deciding to reject or adopt it are: (1) its relative advantage, (2) its compatibility, (3) its complexity, (4) its divisibility, and (5) its communicability (9, p. 124). In Rogers' viewpoint:

> It matters little whether or not an innovation has a great degree of advantage over the idea it is replacing. What does matter is whether the individual perceives the relative advantage of the innovation. Likewise, it is the potential adopter's perceptions of the compatibility, complexity, divisibility and communicability of the innovation that affect its rate of adoption (19, p. 124).

Although these characteristics of innovations are

not the only ones affecting adoption or rejection, Rogers regards these as "potentially useful tools for the analysis of the characteristics of new ideas" which influence the rate of adoption (19, p. 134).

Adopter Categories

Rogers uses the criterion of time of adoption to classify or categorize individuals who adopt new practices. Lionberger agrees with this basis of classification. He contends:

> The fact that people adopt new ideas or practices at different times means that they can be classified in terms of their time position in the adoption pattern (12, p. 36).

The present study, however, was not concerned with the adoption of innovations over time. Rather, the focus in this study was on the adoption of innovations at one point in time, that is, the time at which the adoption scale was administered. According to Rogers, this method which focuses on the number of innovations adopted secures a rough estimate of the time of adoption (18, p. 352).

Rogers identified five adopter categories on the basis of the research evidence he used to develop his theories. The five adopter categories are ideal types. In other words, the categories are "conceptualizations that are based on observations of reality and designed to institute comparisons" (19, p. 168). This classification, however, does not suggest that there are sharp divisions

among each of the five categories along the innovativeness continuum. It is simply a classification system of dividing individuals on the basis of time of adoption relative to each other.

The five adopter categories utilized by Rogers reveal differences on the basis of the individual's personal characteristics, communication behavior, and social relationships.

Innovators. Innovators are venturesome and are eager to try new practices. In addition to their tendency to take risks, innovators generally are young since they are less likely to be conditioned by traditional practices. Innovators have relatively high social status, for instance, in terms of amount of education. Innovators secure new ideas from impersonal and cosmopolite sources of information. A study by Coleman and others revealed that physicians who innovate were more likely to attend out-of-town medical meetings (5). Innovators interact a great deal with their own kind and also they are cosmopolite. In general, they travel widely and participate in affairs beyond their immediate system.

Early adopters. Early adopters are the respected members of the local social system. In addition to being respected they are also localites. Thus, the individuals of this adopter category are the opinion leaders for most of the group members. "Potential adopters look to them

for advice and information about the innovation" (19, p. 169). Because early adopters are not far removed from the average individual on the innovativeness continuum, they serve as a role model for many of the other members of the social system.

Early majority. These individuals deliberate for some time before completely adopting a new practice. Usually, they are willing to consider the new idea but only after most of the innovators and early adopters have accepted it. The majority of their interaction is with peers although they may have contacts with leaders in the external system. They are above average in social status.

Late majority. This category of individuals includes the cautious and skeptical. They adopt an innovation only after most other individuals in their system have done so. These individuals usually adopt because they succumb to the social pressures exerted on them. They need the pressure of their peers to motivate adoption. Finally, it may be stated that they are below average in social status and have few contacts with individuals outside their peer group.

Laggards. Laggards are tradition oriented and are the last to adopt an innovation. They use the past for their point of reference. They are the lowest in social status and there is a tendency for these individuals to be the oldest members in the social system. They are extremely

localite and many are near-isolates. These individuals have very few contacts outside their system. Laggards are suspicious of innovations, innovators and change agents.

Characteristics of Adopter Categories

Rogers has compared the research findings on the characteristics of adopter categories and has developed several generalizations concerning the correlates of innovativeness.

Several of these generalizations provide the theoretical base for the present study. In general, it may be stated that the theoretical framework developed by Rogers was adapted to the specific situation of the present study.

IV. CHARACTERISTICS OF ADOPTERS

Rogers has developed generalizations concerning such characteristics as age, social status, financial position, specialization, cosmopoliteness and mental ability. Several of these generalizations pertinent to the present study are developed under subsequent subtopics.

Age

Rogers indicates there is adequate theoretical support to expect the younger individuals of a social system to be more innovative. In a rapidly changing culture,

younger people learn a more modern set of cultural values than do older people, whose socialization took place during an earlier period. The younger individuals are, therefore, less conditioned by the older culture; hence, they are more innovative (19, p. 174). Barnett (1, p. 386) and Gardner (8, p. 32) reassert Rogers' viewpoint. In addition, Barnett concludes that there is an age differential in adoption (1, p. 386).

On the basis of theoretical support Rogers generalizes, "Earlier adopters are younger in age than later adopters" (19, p. 313).

Social Status

Rogers defines social status as "an indicator of one's position in the social structure. It may either inhibit or enhance an individual's access to sources of information and his willingness to deviate from group norms" (19, p. 290). In a somewhat similar manner Secord defines status as "the worth of a person as estimated by a group or a class of persons. The estimate of worth is determined by the extent to which his attributes or characteristics are perceived to contribute to the shared values and needs of the group or class of persons" (21, p. 294).

On the basis of a similar viewpoint Rogers concluded, "Earlier adopters have higher social status than later adopters" (19, p. 313).

Cosmopoliteness

Cosmopoliteness is defined as the "degree to which an individual's orientation is external to a particular social system" (19, p. 102). An individual's orientation can be placed along the cosmopolite-localite dimension.

Innovators and early adopters use reference groups which are more likely to be outside rather than within their social system. According to Merton the local is described as "parochial," confined in his interest to the local community; the cosmopolitan, on the other hand, identifies with issues and social organizations outside his local community (14, pp. 387-420).

Gouldner points out that the cosmopolitan's major reference group is external to his social system, he ranks low on loyalty to the employing organization but ranks high on commitment to professional skills. The local's major reference group is internal to his social system, he ranks high on loyalty to his employing organization and ranks low in commitment to professional skills (9, pp. 281-306).

Applying these constructs to the teaching occupation Corwin takes the position that the teacher's obligations as a professional person are in several respects in conflict with the concept of the teacher as an employee. Since professions are nation-wide organizations the professional obligations exert a cosmopolitan influence on members of

the profession. The professional teacher is one who is bound by the standards of education that are set and sanctioned largely outside of the local community. Employee obligations, on the other hand, are locally inspired and enforced. The employee roles are considered local and parochial in origin; while the professional roles are cosmopolitan and ecumenical in origin (6, p. 221).

Cosmopolitans tend to be low in loyalty to the local community and employing organization; their orientation is to the opinions of their professional colleagues outside the organization (6, p. 221). Furthermore, cosmopolitans are likely to support professional principles, such as academic freedom, which transcend local values (6, p. 419). Corwin points out that cosmopolitan-oriented teachers use their profession as a reference group. They are inclined toward the arguments of their professional associations (6, pp. 382-383).

Corwin's contention is that the relative amount of change in a school is partly a function of the cosmopoliteness of its teachers (6, p. 419).

The position taken by Rogers supports Corwin's contention. Rogers hypothesizes that innovativeness varies directly with cosmopoliteness. If one's major reference group is external to a particular social system, greater deviation from that system's expectations for one's behavior is likely, and the adoption of new ideas may

result (19, p. 309).

Rogers concludes, "Earlier adopters are more cosmopolite than later adopters" (19, p. 182).

Sex

Barnett reports that it has been both affirmed and denied that women are more conservative than men. Barnett, however, takes the following position:

> There is no evidence to support the view that there is an absolute universal difference between the sexes in this respect, but it is defensible to maintain that in specific contexts there are consistent regularities which exceed chance expectations (1, p. 407).

Furthermore, Barnett claims the predispositions to innovations are a function of cultural variables (1, p. 407). A similar view has been expressed by Charters with respect to teacher career patterns. In this case, Charters indicates that the career pattern for women may be understood in terms of the cultural and subcultural norms of society; the career pattern for men, in terms of economic forces. "Where women may work, men must work" (4, p. 186). The reality of this situation may have implications for males in adapting to change.

In addition, Barnett claims men have a great opportunity to observe and adopt new ideas since men are almost always in the communications limelight for the transmission of new ideas. The exception to the rule is, of course, those ideas which pertain exclusively to women (1,

p. 409).

On the basis of the above theoretical support the following conclusion appears to follow: there is a tendency for men to be earlier adopters than women.

In recognition of the generalizations drawn with regards to the above characteristics of individuals, it is likely that adoption is to a great extent affected by characteristics such as: (1) one's age, (2) one's social status, (3) one's cosmopoliteness, and (4) one's sex. According to Carlson an individual's characteristics are an important factor in the adoption of innovations. Carlson states,

> . . . the rate of acceptance of a new practice by individuals or adopting units is dependent on (1) the characteristics of the adopting unit, (2) the way the adopting unit is joined to communication channels and sources of information, and (3) the position the adopting unit holds in the social structure of like units (3, p. 10).

Statements such as the one by Carlson lend further support for the contention that certain characteristics tend to be related to an individual's decision to adopt an innovation.

In conclusion, it may be stated that adoption of instructional innovations at the classroom level involves a decision on the part of the classroom teacher to accept or reject the instructional innovation. These decisions are a reflection of the individual's characteristics. Such characteristics as age, social status, financial

position, specialization, cosmopoliteness and mental ability tend to bear a relationship with innovativeness.

V. SUMMARY OF CHAPTER II

To recapitulate, the adoption of instructional innovations was conceptualized as a decision-making process. To account for the variables which influence adoption of new practices Rogers' adoption theory was employed. This theory attempts to explain the stages which an individual follows as he is confronted with the decision of adopting a new practice. The processes through which individuals pass in adopting an innovation consist of five stages: awareness, interest, evaluation, trial and adoption.

The variables which influence an individual as he goes through the adoption process include: (1) antecedents, the personal and situational factors; (2) information sources, and (3) the characteristics of the innovation.

According to the theory five adopter categories were conceptualized from observations of reality. These categories are designed to institute comparisons and to guide research efforts.

The characteristics of adopter categories were presented in the form of generalizations. According to Rogers' adoption theory certain characteristics of an

individual will influence the individual to adopt an innovation. Applying Rogers' theory to the present study, certain characteristics of junior high school teachers may be related to instructional innovativeness of these teachers.

In conclusion, adoption of instructional innovations has been conceptualized as an individual matter and the decision to adopt an innovation may reflect the individual's characteristics.

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CHAPTER III

REVIEW OF LITERATURE

In Chapter I the problem was stated and the terms defined. The problem, briefly stated, was to determine whether a relationship exists between the instructional innovativeness of junior high school teachers and certain characteristics of these teachers. Chapter II dealt with the theoretical framework of the study.

In this chapter research evidence from studies conducted in education and outside of education is cited. The research evidence is reported in two separate parts. Each part deals with a specific set of characteristics. One set of characteristics include personal and situational factors which may influence the individual to adopt innovations. The personal factors include such characteristics as sex, marital status, age, and teaching experience; situational factors focus on the type of school (junior high or elementary-junior high) to which the teacher is assigned and the size of school in which the teaching assignment is carried out. The second set of characteristics deal with the professional characteristics of the individual. The professional variables include the number of years of post-secondary education, the recency of in-service education, attendance of teachers' professional organization meetings,

membership in subject area associations, and professional attitudes.

In the light of this research evidence and on the basis of the theoretical support presented in Chapter II, hypotheses are developed and stated.

I. PERSONAL AND SITUATIONAL VARIABLES

Sex

The individual's sex has been shown to be a major variable in some education research projects. For instance, Ingram found males more highly committed to the teachers' professional organization than females (14, p. 152). However, studies which have explored innovativeness and the variable, sex, are scarce. Charters urges researchers to take this variable into account in their research (4, p. 192). Few studies exploring innovativeness have considered this factor.

Nevertheless, several studies have examined this aspect. Ross reports that men teachers improve the innovativeness of the system at the high school level (33, p. 143).

In another study reported by Mort and Cornell the relationship between the proportion of men teachers and the innovativeness of the school tended to be positive. However, these researchers considered the relationship negligible (23, p. 272).

On the basis of the research evidence reported by Ross, Mort and Cornell the following hypothesis was stated.

Hypothesis 1: Junior high school teachers classified on the basis of sex differ significantly in instructional innovativeness.

Marital Status

Marital status has been found to be a significant factor in several studies. However, Mort and Cornell report a zero correlation between the percentage of single teachers and the innovativeness of the school. In addition they point out that differences in the marital status of women teachers does not explain relationships observed in innovativeness (23, p. 273). It should be pointed out that Mort and Cornell report recognition only of the marital status of women teachers and not of men teachers.

Ross, on the other hand, reporting Buley's findings indicates that a large per cent of married teachers in high school provides a better environment for innovativeness than at the elementary school where the reverse is true to a highly significant degree (33, p. 148).

Lippitt and colleagues use marital status as a possible explanation accounting for the variability in classroom innovativeness. They conjecture that teachers who are married and have come back to school from having children, are more willing to try out and experiment with new ideas (22, pp. 322-323).

On the basis of the above support it is apparent

that marital status may be a factor influencing instructional innovativeness. In the light of these arguments the following hypothesis was stated.

Hypothesis 2: Junior high school teachers classified on the basis of marital status differ significantly in instructional innovativeness.

Age

Research findings concerning age are somewhat contradictory. Rogers reports nine studies which reveal younger age associated with innovativeness. In three other research projects the data revealed that older age was associated with innovativeness. In the analysis of ten additional studies Rogers found no significant relationship between age and innovativeness (31, p. 172).

By comparing a research study in medicine with one in rural sociology, Katz concluded that, in general, innovativeness is positively associated with younger age. Katz's comparison revealed that:

> Farmer-innovators were young; doctor-innovators, while very unlikely to come from the oldest age group, were slightly more likely to be in the middle-age bracket than in the very youngest group (17, p. 80).

In education research, similar contradictory conclusions have been drawn from the evidence. Mort and Cornell's Pennsylvania Study suggests the innovativeness of the school system is positively associated with the median age of teachers (23, p. 276). Mort and Cornell concluded that administrative decisions are based on a misconception

about the relationship between age and innovativeness. They indicate that neither of the beliefs, that older teachers are out-of-date and unprogressive in their ideas, or that younger teachers, whose professional training has been more recent, are more receptive to educational change, are substantiated in the Pennsylvania Study (23, p. 390).

Ross has reported findings of research which confirm the findings of the Pennsylvania Study. Ross states:

> The age characteristics of a school staff at both the high school and elementary school levels give a significant and highly significant relationship with adaptability. In this instance, the average age of these adaptable school staffs is 41.1 years and 41.8 years respectively, while the least adaptable schools were taught by staffs with an average of 37 years for elementary school and 37.6 years for the high school (33, p. 144).

On the basis of these findings Ross concluded, "age is no barrier to adaptability" (33, p. 129). It should be pointed out, however, that Ross draws this conclusion from studies which attempted to discover how the characteristics of the total school staff correlated with the school's innovativeness. These studies did not use the individual teacher as a unit of analysis. Nevertheless, these findings are pertinent to the present study.

A generalization drawn by Mort and Ross from a collection of more recent research emphasizes that the per cent of staff from thirty-six to sixty years old is positively related to the system's innovativeness (24, p. 197). In other words, the greater the percentage of teachers in

this age category, the more innovative the school will be.

Similar to the studies reported by Ross, a recent study (1965) by Eibler focused on staff characteristics. This study appears to support the earlier findings of the "Mort tradition". Eibler hypothesized that faculties having more members who are younger will be high innovators. However, the data did not support this hypothesis. Instead he found a much greater percentage of teachers between the ages of twenty and twenty-nine who were low innovators, as compared to teachers of this same age category who were high innovators. In the group above forty years of age the data revealed considerably more high innovators than low innovators (9, pp. 179-181). Eibler concluded that "faculties who had more members that were older tended to be the high innovators" (9, p. 185). However, in this study, as in those of the "Mort tradition" the focal point was the total teaching staff and not the individual teacher.

The research study carried out by Lippitt and associates focused on individual teachers attempting innovations in classrooms. The findings of their research partly support the evidence from Mort's studies and Eibler's Detroit study. However, the evidence arising from Lippitt's research also contradicts in part some of the findings from the two previous studies. The research evidence arising from Lippitt's study led Lippitt and his associates to

conclude that:

> The younger and older teachers appear to be doing the most innovating in our sample. Perhaps this means the younger teachers who are recently out of college, or the older teachers who have come back to school from having children, are more willing to try out and experiment with new ideas; and that the middle range of teachers are less willing, in fact, to experiment. . . . In general, the data show that older teachers tend to be potential adopters more than do younger teachers; but younger teachers seem to be more innovative (22, pp. 322-323).

Holdaway's study which focused on the elementary school principal tends to partially contradict Lippitt's findings. His data revealed that the extent of adoption of innovations was negatively correlated, at the 0.05 level of significance or higher, with the age of the principal (13, p. 94). Holdaway concluded,

> A reasonable overall assessment of these findings appeared to be that the older and more experienced principals tended to be less innovative than the principals who were younger and less experienced in the school system (13, p. 83).

In general, studies using the individual as a unit of analysis appear to indicate that adopters and innovators tend to be younger. For instance, evidence from Carlson's studies which focused on school superintendents is contrary to the pronouncements of the "Mort research tradition". Carlson's comparison of scores achieved by innovators and non-adopters indicated a tendency for innovators to be younger (3, p. 65).

In a simulated administrative situation described by Griffiths, age did not appear to be a factor. In this

simulated situation 232 elementary principals considered changes in policy, duties and personnel which they would make if they were principal of an imaginary "Whitman School". Griffiths found no significant relationship between the "change score" and such biographical data as age, experience, or education (11, p. 279).

The findings of an Alberta study which investigated factors related to the innovativeness of elementary principals are consistent with Carlson's findings. In this study, Marion, on the basis of the results, concluded that innovative elementary school principals tend to be relatively younger (20, p. 192).

Other studies also support the contention that adoption of innovations is positively associated with younger age. For instance, Willower reports age as a factor associated with innovation in pupil control practices. In this particular study it was concluded that "the older teachers held generally conservative views, while the younger teachers were more liberal and permissive" (38, p. 258).

The evidence arising from a recent Saskatchewan study which investigated teacher reaction to change indicates that responses did not differ according to the age of the respondent. However, a greater proportion of the inexperienced teachers believed that change was necessary (25, p. 26). This suggests that the inexperienced teachers

who are probably younger are more flexible in their attitudes to change. Hence they should be more receptive to adoption of innovations. However, many instructional innovations to be adopted require specific skills and classroom confidence. The young and inexperienced lacking these skills and confidence might be hesitant to adopt new practices.

The research evidence reported by Mort and Cornell, Ross and Eibler tend to support the generalization that the older teachers tend to be more innovative. The findings of Holdaway, Marion, and Carlson substantiate the position that the younger individuals are more innovative. In the light of this evidence the following hypothesis concerning age and innovativeness was stated.

Hypothesis 3: Junior high school teachers classified on the basis of age differ significantly in instructional innovativeness.

Teaching Experience

As in the review of the literature on age, similarly, there are many inconsistencies in the findings on the relationship of experience and innovativeness. For instance, Ross reports findings that suggest the number of years of teaching experience found in the most innovative high schools and elementary school was 19.1 and 18.3 years respectively. The least adaptable staff is characterized by 15 years of total experience for the high school and 15.2 years for the elementary school (33, p. 145).

Eichholz, in his study of the rejection of innovations which is the opposite of adoption, found no appreciable relationship between rejection and the number of years of teaching experience (10, p. 267). Nevertheless Eichholz and Rogers report Kelly's findings which indicate years of teaching experience to be a significant factor in the adoption of educational innovations (21, p. 304).

In a study of selected administrative behaviors among administrators from innovative and non-innovative school districts, Klingenberg found significant difference between innovativeness and the number of years of experience. This finding prompted Klingenberg to conclude that:

> Administrators in innovative systems have more years experience as educators in general and administrators in particular than those in non-innovative systems (18, p. 2789).

Eibler, in his Detroit study, also examined the relationship between overall experience and innovativeness. He found that the experience category of twenty or more years of overall teaching experience contained twice as many high innovators as low innovators. In discussing the innovativeness of teachers with nine years or less experience, including beginning teachers, Eibler concluded, "there are more low innovators than high innovators" in this experience category. These findings provide support for the statement that "faculties having members with more overall teaching experience will be high innovators" (9,

p. 183).

The research evidence on the relationship of the experience factor and innovativeness cited by Ross tends to support Eibler's findings. The results of this particular study indicate the high point of staff innovativeness is during the intermediate years of professional service and it is suggested that the early years and late years are not so productive (33, p. 145). Ross reports:

> Three years or less of experience is markedly related to the least adaptable groups; four to six years continues negative but not strong in its relationship. The seven to nine year service period appears to be a transition point from where it can be expected that the school will begin to get the full benefit of the teacher's tenure (33, p. 145).

There is a suggestion in a study by Brickell that the beginning teacher will not be very innovative. This suggestion is implied in Brickell's study of educational change in New York State. Brickell points out that colleges and universities responsible for teacher education programs "have little influence on instructional innovation in elementary and secondary schools" and furthermore, they "do not attempt to equip the prospective teacher with specific instructional techniques, but concentrate on developing a general professional wisdom" (2, p. 85). Brickell's findings imply that the novice will lack many of the necessary skills for instructional innovation in the early part of his career. This lends support to Ross'

contention that teachers with three years or less experience tend to be the least innovative group.

The research evidence cited suggests that the number of years of teaching experience is a factor related to the innovativeness of the individual. On this basis the following hypothesis was stated.

Hypothesis 4: Junior high school teachers classified by total years of teaching experience differ significantly in instructional innovativeness.

Specialization

One situational factor which has been reported to influence innovativeness is the degree of specialization of the unit in which the individual works. For instance, Rogers reports three studies in rural sociology where specialization was a correlate of innovativeness. In these cases the individuals who specialized tended to be innovators. Rogers explains this relationship by pointing out that specialization permits the innovator to keep up to date more easily in his specialty, and may lead him to seek more cosmopolite sources of information (31, p. 177).

Rogers' composite picture of adopter categories drawn from research evidence in education, agriculture and medicine suggests that innovators and early adopters work in the largest and most specialized operations. Those individuals who are low adopters occupy units of little specialization (31, p. 185).

Differences in innovativeness due to the types of specialization or the type of school classification have been suggested by Ross. This difference is implied in the recognition by Ross that size is not as closely related to innovativeness in elementary schools as in the high schools (33, p. 109).

The recognition of this factor suggests that the type of school whether it be elementary, elementary-junior high, junior high or other may be a factor influencing the instructional innovativeness of teachers. It would appear that junior high school teachers who carry out their teaching assignment in junior high schools would be in a more advantageous position to specialize than junior high school teachers assigned to elementary-junior high schools. This difference in the degree of specialization of the unit may influence the instructional innovativeness of teachers.

In the light of the research reported by Rogers and the notation made by Ross, the following hypothesis was stated.

Hypothesis 5: Junior high school teachers classified on the basis of the type of school differ significantly in instructional innovativeness.

Size

The final situational factor to be considered in this review of the literature is size of the unit. Several

authorities report that this situational factor affects the individual's innovativeness.

Rogers cites Mulford's study concerning the establishment of local industrial development corporations as an example of the influence of size on innovativeness. The Mulford study indicated that communities which were innovative in adopting an organizational idea were much larger in size than the non-innovative communities (31, p. 175).

In the field of education, Mort and Cornell report findings from the Pennsylvania study indicating that the variation in the innovativeness of school districts was attributable to size. The conclusion drawn from the Pennsylvania study was that the large district is more innovative than the small district (23, p. 58).

Ross reports that in the Pennsylvania study, size, as measured by school population, was found to correlate positively with innovativeness. However, he points out that in Pierce's study of school districts near New York City somewhat different results were found. In this case, size was not found to be as important as in the Pennsylvania study (33, p. 109).

More recently Carlson found high rates of adoption of innovations associated with school systems that have comparatively large enrollments (3, p. 55).

Similarly, in a study of the adoption of automatic

data processing in large Canadian school districts Hemphill found a relationship between size and adoption. Three variables, namely, total enrollment, grade nine enrollment and total education staff, revealed significant differences between adopter and non-adopter districts. In each case adopter districts tended to be larger than non-adopters. In addition Hemphill found that there was a tendency for adopter boards to have more members than non-adopter boards (12, p. 125).

The research evidence cited appears to support a postulation that teachers from different sizes of schools will vary in instructional innovativeness. On the basis of the evidence cited the following hypothesis was stated.

Hypothesis 6: Junior high school teachers classified by school size differ significantly in instructional innovativeness.

II. PROFESSIONAL CHARACTERISTICS

This section of the review of literature is dealt with in five sub-sections: (1) education, (2) in-service education, (3) professional participation, (4) professional teacher attitudes, and (5) cosmopoliteness.

Education

Young has summarized several important clusters of characteristics of adopters. Social status is one of these clusters and the amount of education is included as a measure of social status (39).

In rural sociology studies it is generally accepted that one of the factors positively related with innovativeness is education (19, pp. 84, 97-98). For instance, van den Ban found the education of the farmer to be one of three factors related to his progressiveness (36, p. 209). Furthermore, Christiansen draws attention to Havens' analysis of twenty-five studies in which amount of education was a factor that was correlated with innovativeness. In only one of these studies did education not show a significant relationship with the farmers' innovativeness (6, p. 47).

In education research similar relationships have also been discovered. Mort and Cornell, for example, arrived at such a conclusion in the Pennsylvania Study.

> The single measure dealing with teachers which was found to have the greatest relationship with the adaptability of a school was the average number of years of training of teachers beyond high school (23, p. 277).

Ross, however, points out that this is not a linear relationship. He cites evidence indicating that five years of training is an optimum amount favoring innovativeness. With further training the relationship tapers off. It takes a greater amount of training in educational courses to make a staff innovative at the high school level than it does at the elementary (33, p. 136).

A recent study by Eibler provides evidence supporting a positive relationship between training and

innovativeness. He found faculties having teachers with higher academic preparation were high innovators (9, p. 185).

From his study of experienced teachers of vocational agriculture, Christiansen found statistically significant results pertinent, in a way, to the present discussion. Christiansen found that the more innovative the experienced teacher is, the greater the amount of education he is likely to have obtained in a formal credit program since his initial certification (6, p. 120). Thus indirectly a positive relationship between education and innovativeness is supported.

Carlson used amount of education as one dimension of social status in his studies which focused on the innovativeness of school superintendents. In the Allegheny County study the results indicated that the rate of adoption of innovations is positively and significantly correlated with the amount of education (3, p. 55). However, the amount of education was not significantly correlated in the West Virginia study (3, p. 59). Carlson's comparison of the scores achieved by adopters on all innovations and non-adopters indicated a tendency for non-adopters to have less formal education (3, p. 64).

More recently, in an Alberta study, Marion examined the relationship of selected factors of elementary principals and their innovativeness. One of these factors was

the amount of education. However, contrary to his expectations, Marion found no significant relationship between the amount of education of the principals and either of two indices of innovativeness (20, p. 151). However, it should be pointed out that all principals in the study, in general, had a high level of preparation. This probably accounts for the lack of discrimination (20, p. 193).

The research findings reported by Christiansen, Mort and Cornell, Eibler and Carlson appear to support the generalization that innovativeness is a function of the amount of education. Ross, however, reports evidence suggesting this relationship is not linear. On the basis of these research findings the following hypothesis was stated.

Hypothesis 7: Junior high school teachers classified by the number of years of post-secondary education differ significantly in instructional innovativeness.

In-Service Education

The recency of participation in an in-service education program has been found to correlate with innovativeness.

Ross reports findings which suggest that the recency of in-service and professional education correlates significantly with innovativeness. In this case a relationship existed between professional training every four years and innovativeness at the elementary level (33,

p. 137).

From the available research evidence, Ross concluded that the high school teacher needs more, and more frequently renewed, educational courses than the elementary teacher (33, p. 129).

Way's examination of the impact of the Metropolitan School Study Council on teachers supports the conclusion that teachers who participate in in-service programs are more innovative. These teachers, according to Way, obtained many new ideas, information and techniques from such participation (37, p. 19).

A finding similar to Way's has also been reported by Peterman. Peterman's Michigan study examined the relationship between in-service education and the innovativeness of classroom teachers. The data revealed that in-service education is an effective vehicle in fostering innovations. Peterman concluded, "Teachers who have more contacts with outside sources through in-service education have more innovations in the classroom" (26, p. 2800).

In a recent Saskatchewan study the data revealed that in-service meetings appeared to be the best feature of the change process according to the teachers. However, the only significant difference that attendance at in-service meetings appeared to make was that a larger percentage of those who attended more meetings felt that they had been given enough help (25, p. 26).

In reference to the adoption of educational classroom practices, Purvis notes that while it is impossible to produce definite proof, it is strongly suspected that many of the teachers who have adopted new practices have done so as a result of their participation in in-service programs (27, p. 68).

The research evidence suggests that in-service education influences innovativeness. However, the significant factor appears to be the recency of participation in an in-service program. In the light of this evidence the following hypothesis was stated.

Hypothesis 8: Junior high school teachers classified on the basis of recency of in-service education differ significantly in instructional innovativeness.

Professional Participation

In addition to education, "professionalism" is another dimension which may be used to plot an individual's status position. According to Corwin there is a drive for "professional status" in an occupational group such as teaching (7, p. 427). The attribute of "professionalism" is considered to improve the status of the teaching occupation (8, p. 25).

Young, in her summary of adoption studies, identified "professionalism" as a characteristic of adopters which correlates with adoption. She defined "professionalism" in terms of quality and quantity of contacts with

sources of information. Furthermore, she concluded that the frequency of contact with such sources of "professionalism" and the quality of contacts, for instance actual participation, or attendance at meetings, correlate with adoption (39).

It has been suggested by Ingram that the attitudes of the professional staff towards the teachers' organization and to participation in its activities will determine in large measure their attitudes to innovation (15, p. 19).

Participation in teacher organization activities can have different levels of involvement. Recent research by Fox and Lippitt suggests relevant findings in this respect. In this study the data revealed that the amount of involvement by individual teachers in various activities provided them was directly related to their rate of innovation (21, p. 296). These findings tend to substantiate Young's contention that the quality and quantity of participation is a measure of "professionalism" (39).

Christiansen's findings also indicate a statistically significant relationship between innovativeness and the extent of participation in professional meetings. In this case, Christiansen found the more innovative the experienced teacher is, the greater the number of non-local professional meetings he is likely to attend (6, p. 167).

Research findings relevant to this aspect of the

investigation are also reported by Brickell. He asserts that the participation in teachers' professional organization meetings increases instructional innovation. According to Brickell, "professional associations are the supreme communicators in the profession," but, he indicates "the communication they provided, however, is random, disjointed, overlapping, and unfocused" (1, p. 53). Nevertheless, Brickell reports these meetings of professional associations provide a medium of exchange, namely, the informal contact among individuals.

In a study of factors related to curricular innovations in the junior high school Jacobs found teachers from high innovative schools participated in many more professional activities than did teachers from low innovative schools (16, pp. 132-133).

The research evidence cited seems to support the following general hypothesis.

Hypothesis 9: Junior high school teachers classified by participation or non-participation in the activities of professional teachers' organizations differ significantly in innovativeness.

It appears that the frequency of such participation and the type of participation may be significant factors influencing adoption of innovations. The evidence cited suggests the postulation of the following sub-hypothesis:

Sub-hypothesis 9.1: Junior high school teachers classified on the basis of the frequency of attendance at division association meetings differ

significantly in instructional innovativeness.

9.2: Junior high school teachers classified by participation or non-participation in activities at the divisional level differ significantly in instructional innovativeness.

9.3: Junior high school teachers classified by participation or non-participation in activities at the provincial level differ significantly in instructional innovativeness.

Professional Teacher Attitudes

Another measure of "professionalism" which may be used to plot an individual's status position in an occupational group is the individual's "professional" attitudes. The degree to which an individual's "professional attitudes" or "professional orientations" are similar to the "professional attitudes" advocated by the teachers' organization is likely to reflect the status of the teacher among his colleagues and peers.

Ratsoy, for example, developed a discriminating "professional" attitude scale and found that prospective teachers in two alternate programs of teacher preparation differed significantly in "professional" attitudes (29, pp. 187-188). More recently Ratsoy focused on the "professional" teacher attitudes of high school students. In this study he found that high school students classified by grade differed significantly in the attitudes. Both these studies reveal a progression in means from high

school through the freshman and senior years in the teacher preparation program (30, p. 7). "Professional" attitudes, therefore, appear to be an attribute which may be used to plot an individual's status position among his colleagues.

Marion used an attitude scale to measure the "professional" status of elementary principals. Using a scale somewhat similar to Ratsoy's, Marion found a positive relationship between "professionalism" and innovativeness on two indices of innovativeness (20, pp. 154-156). Furthermore, Marion's study of factors related to the elementary school principal's innovativeness, revealed that professionalism was one of three predictors accounting for nearly twenty-four per cent of the variance in innovativeness as assessed by one index of innovativeness (20, p. 176). Marion also compared his first regression analysis with the second and found that professionalism was one of two factors which appeared in both analyses (20, p. 177).

Other research evidence supports the contention that innovativeness is a function of professionalism. Carlson, for example, found that professionalism was one of two status factors which correlated with the rate of adoption at the 0.05 level of significance in both Allegheny County and West Virginia (3, p. 59). In addition, Carlson compared the professionalism scores received by non-adopters with those of adopters and the comparison revealed that non-adopters had a tendency to be

rated lower on professionalism (3, p. 64). In addition, innovators were compared with all those who had an equal chance to be innovators. This comparison revealed a tendency for innovators to receive high professional ratings (3, p. 65).

Chesler and others also found "professional orientation" to be related to innovativeness. In this study the analysis focused on the principal's influence in promoting classroom innovation. The findings revealed that principals who were more "professionally" oriented influenced innovative teaching. Thus principals with the innovative staffs were more "professionally" oriented than those with less innovative staffs. The former were concerned with improving classroom processes, encouraging teacher growth, and continually evaluating pupil learning. The latter group tended to be more "administratively" oriented. Their prime concern centered on achieving a smoothly running organization (5, p. 275).

Corwin hypothesizes a positive relationship between professionalism and innovativeness. He maintains:

> . . . the rate at which a teaching innovation (such as team teaching) spreads throughout the country is directly related to the level of training and authority of teachers in the discipline to which the innovation applies (7, p. 424).

On the basis of the research evidence reported by Marion, Carlson, Chesler and others it appears that

"professional" attitudes or "professional" orientation is a factor which influences innovativeness. In addition Corwin's argument appears to support such a relationship. This evidence suggests the following hypothesis.

Hypothesis 10: Junior high school teachers classified by high or low professional attitude scores differ significantly in instructional innovativeness.

Cosmopoliteness

Cosmopoliteness, the degree to which an individual's orientation is external to a particular social system, has also been found to be related to innovativeness.

Rogers cites thirteen studies in education, rural sociology and medicine where a positive relationship has been found between innovativeness and cosmopoliteness (31, pp. 183-184).

The cosmopolitan and local concepts have been used in several education research studies. Suthoff, for example, used these concepts in his investigation of the participation of parent-teacher association members in school affairs. Pertinent to this study, was his finding that cosmopolitans were better equipped than locals to communicate fresh ideas about educational practice. He also found that locals tended to belong to service clubs while the cosmopolitans tended to belong to professional associations (35, pp. 3-4).

In another education study Rogers points out the

finding made by Ross. In this case Ross reported that teachers at more innovative schools were relatively more likely to get new educational ideas from outside their community (31, p. 183). Rogers also draws attention to Cocking's findings that cosmopolite schools, located nearer to metropolitan cities, were more innovative (31, p. 42).

Carlson's study of two samples of school superintendents revealed a positive relationship between innovativeness and cosmopoliteness (3, pp. 53-57).

More recently, Marion, found the more cosmopolite principals to be more innovative than their colleagues. The evidence from Marion's study indicated a positive relationship between cosmopoliteness and two dependent variables, the number of innovations adopted and the extent of adoption (20, p. 159).

The studies reported in this review indicate that a cosmopolitan orientation influences innovativeness. Teachers may be classified as locals or cosmopolitans according to their major reference group orientation. Andrews, for instance, found that teachers used different reference groups. He identified two major sub-groups among secondary teachers. These are a sub-group responsive to a subject matter reference group which he defines as ". . . the actual or idealized group consisting of former subject matter colleagues and college teachers . . . ,"

and a sub-group responsive to the teacher reference group consisting of ". . . the authoritative and prestigeful group in the school whose orientation is teaching and Education rather than a particular subject matter field" (28, p. 47).

Theoretically, the subject matter oriented teachers may be classified as cosmopolitans and those whose orientation is towards the teachers in the school may be referred to as locals.

Hence a teacher's membership in subject associations might be indicative of an orientation which is external to the local school system. Teachers who are members of subject associations may be classified as more cosmopolitan in their orientation. Teachers who are not members, on the other hand, being less cosmopolitan, may be referred to as locals.

On the basis of the theoretical support and the research evidence the following hypothesis was stated.

Hypothesis 11: Junior high school teachers classified by cosmopolitan or local orientation differ significantly in instructional innovativeness.

III. SUMMARY AND STATEMENT OF HYPOTHESES

The present chapter was concerned with a review of studies relevant to the problem and sub-problems set out in Chapter I. Essentially the review of literature focused on two types of characteristics; one set included

personal and situational factors, and the second set consisted of professional variables.

In the light of the research evidence reported in the present chapter and the theoretical analysis presented in Chapter II, hypotheses were developed and stated. Eleven hypotheses were formulated linking instructional innovativeness with two types of characteristics of adopters.

These eleven hypotheses are re-stated as follows:

Hypothesis 1: Junior high school teachers classified on the basis of sex differ significantly in instructional innovativeness.

Hypothesis 2: Junior high school teachers classified on the basis of marital status differ significantly in instructional innovativeness.

Hypothesis 3: Junior high school teachers classified on the basis of age differ significantly in instructional innovativeness.

Hypothesis 4: Junior high school teachers classified by total years of teaching experience differ significantly in instructional innovativeness.

Hypothesis 5: Junior high school teachers classified on the basis of the type of school differ significantly in instructional innovativeness.

Hypothesis 6: Junior high school teachers classified by school size differ significantly in instructional innovativeness.

Hypothesis 7: Junior high school teachers classified by the number of years of post-secondary education differ significantly in instructional innovativeness.

Hypothesis 8: Junior high school teachers classified on the basis of recency of in-service education differ significantly in instructional innovativeness.

Hypothesis 9: Junior high school teachers classified by participation or non-participation in the activities of professional teachers' organizations differ significantly in innovativeness.

Sub-hypothesis 9.1: Junior high school teachers classified on the basis of the frequency of attendance at division association meetings differ significantly in instructional innovativeness.

Sub-hypothesis 9.2: Junior high school teachers classified by participation or non-participation in activities at the divisional level differ significantly in instructional innovativeness.

Sub-hypothesis 9.3: Junior high school teachers classified by participation or non-participation in activities at the provincial level differ significantly in instructional innovativeness.

Hypothesis 10: Junior high school teachers classified by high or low professional attitude scores differ significantly in instructional innovativeness.

Hypothesis 11: Junior high school teachers classified by cosmopolitan or local orientation differ significantly in instructional innovativeness.

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CHAPTER IV

INSTRUMENTATION AND METHODOLOGY

The instrumentation and methodology of the study are determined by the nature of the problem outlined in Chapter I. Hence, it was necessary to accomplish the following before data pertaining to the study could be collected and used:

1. Determine the sources of data to be used.
2. Identify instructional innovations.
3. Construct scales to measure the adoption of innovations among teachers.
4. Develop a procedure for securing usable data from teachers.
5. Construct an instrument for collecting data from teachers; independent and dependent variables included.

In brief, data were obtained from junior high school teachers in Manitoba school divisions which met certain criteria. Instructional innovations being used by teachers in the participating schools were identified by principals of these schools. The instructional innovations used in the teacher questionnaire were selected from the list identified by principals.

An instrument was designed to obtain information concerning the personal, situational, and professional factors of teachers and to measure the innovativeness of

teachers. This instrument consists of three parts, namely, personal background, teacher practices, and attitudes. It is included in Appendix D.

The final section of the present chapter deals with an overview of the analysis.

I. SOURCES OF DATA

The School Divisions and Administrative Clearance

An attempt was made to obtain data from junior high school teachers, grades VII, VIII, and IX, in those Manitoba school divisions which met the following criteria:

1. The school division is responsible for public school education, grades I to XII.
2. Teachers teaching at various school levels, elementary, junior high, and secondary, in the school division are under the same salary contract. A salary contract which does not discriminate against the teaching levels would make it equally attractive for teachers to teach at any of the levels.
3. The participating school divisions are located in approximately the same geographical region of Manitoba.

Six school divisions in Manitoba met these criteria. The superintendent of each of these school divisions was contacted to obtain his permission with regard to approaching principals. In addition, the names and addresses of principals and schools where grades VII, VIII, and IX are taught were requested.

Following clearance with the superintendents' office, principals in charge of junior high schools or

elementary-junior high schools were approached to obtain:

1. The principals' willingness in permitting the teaching staff to participate in the project.

2. The principals' assistance in carrying out the study. This assistance involved distributing, collecting and returning the questionnaires as well as attempting to obtain maximum voluntary participation by all teachers on staff.

3. The principals' assistance in identifying instructional innovations in his school. The instructional innovations used in the present study were limited to those which the junior high school teacher is free to adopt for classroom instruction purposes.

4. The number of junior high school teachers on staff in each particular school.

It should be pointed out that junior high school teachers teaching in junior high schools or elementary-junior high schools only were included in the sample.

The Teachers

The decision to use the junior high school teacher as a unit of analysis is governed by the nature of the sub-problems and the types of instructional innovations.

1. An approximately equal representation of both male and female teachers is desirable. It was decided that the junior high level might provide the desired distribution.

2. The nature of the instructional innovations was such that these innovations would be more applicable to junior high school practices.

Thus on the basis of these conditions an attempt was made to obtain data from a maximum number of junior high school teachers teaching in the participating schools at the time the data were gathered.

II. IDENTIFICATION OF INSTRUCTIONAL INNOVATIONS

An instructional innovation as defined for this study refers to those instructional practices and instructional services perceived new by the school principal. In addition, these instructional innovations were to be of the type which the teacher is usually free to adopt or reject for use or assistance in classroom practice.

To identify possible innovations for use in this investigation, a questionnaire was sent to each school principal asking him to identify instructional innovations from a list of ideas and practices. This list consisted of 48 practices which it was hoped would provide a basis for constructing instruments to measure innovativeness. A majority of the 48 practices were compiled from three sources, Noar (7), Grambs and others (4), and Unruh (14). Since the questionnaire containing the 48 practices was open-ended, principals were free to add additional ideas and practices not included in the list of 48 which principals consider to be instructional innovations of the type defined below.

In identifying instructional innovations each principal was asked to consider the following points:

1. An innovation, as defined for this survey, is any new practice that can be adopted or used by the classroom teacher to improve instruction.

2. It does not matter whether or not the practice is new as measured by the amount of time elapsed since first being used in education.

3. The innovation does not need to have been originated in the principal's school or school system.

4. Innovations sought in the survey should be of the type that the classroom teacher is free to adopt or reject without having to consider: (a) administrative approval, and (b) major budgetary limitations.

III. THE ADOPTION SCALE

A major objective of the present study was to investigate whether a relationship exists between certain factors and the innovativeness of junior high school teachers. However, the first consideration in attaining this objective required the development of an adoption scale which would accurately determine innovativeness.

Strong precedents for the use of an adoption scale to measure innovativeness have been established by researchers. According to Rogers, many researchers have utilized these adoption scales (9, p. 352). It is claimed that the simple type of adoption scales measures both the number of practices adopted and the time at which they were adopted as well (9, p. 352). In addition, it has been pointed out that the use of an adoption scale permits adopters to be classified in terms of standard units for comparative purposes (5, p. 108).

Rogers and Rogers concluded from their analysis of

adoption scales in twenty-eight studies that, in general, there is positive evidence of the validity, reliability, and internal consistency of innovativeness or adoption scales. However, the analysis did not provide clear-cut support of unidimensionality (11, p. 336). In other words, there is no clear-cut answer as to whether adoption scales measure only a single general dimension, namely, innovativeness. However, Fliegel tested a hypothesis of unidimensionality of the adoption variable pertaining to a number of new practices and concluded that "adoption could be treated as a single dimension covering a range of practices" (3, p. 284).

Normality of Adoption Scale

The analysis of several research studies by Rogers indicates that the distributions of both (1) single practices over time and (2) adoption of practices scores or innovativeness scores were found to be bell-shaped and approach normality (9, p. 354).

Furthermore, Rogers has pointed out that theoretically adoption distributions might be expected to be normal and that in a number of empirical cases adoption distributions were either normal or closely approached normality (8, p. 350).

Construction of the Adoption Scale

In addition to the basic considerations in con-

structing adoption scales, Rogers and Rogers point to several additional methodological aspects of adoption scales which should be considered in addition to those already discussed. These considerations which the research should take into account when constructing such scales may be summarized as follows: (1) increase the number of items, (2) do not weight scale items, (3) correct the adoption scores for "don't apply" responses, and (4) determine when each practice was adopted in addition to whether it was adopted or not (11, p. 336).

An attempt was made to take the first three considerations into account. The fourth is not a concern of the present study because of the nature of the problem and because the focus of the present study is at one point in time, that is, the time at which the adoption scale is administered. The construction technique gave consideration to other methodological aspects such as validity, reliability, internal consistency and unidimensionality.

Sub-scales. The adoption scale constructed for the present study consisted of four sub-scales. Each sub-scale was designed to measure a specific type of instructional innovativeness.

The four sub-scales include those instructional innovations which represent: (1) instructional aids for use in the classroom, (2) technical or professional assistants, (3) practices to assist in planning and organizing

the instructional program, and (4) instructional practices which focus on individual differences.

The decision to employ sub-scales was made for several reasons. Firstly, it was recognized that there are different aspects of instructional innovativeness. Secondly, there was a high probability that certain sub-scales might provide more discriminating measures of the dimension being investigated, namely, instructional innovativeness. It appeared that grouping the instructional innovations into sub-scales of common factors might guard against the loss of valuable information.

The selection of instructional innovations for the four sub-scales from the principals' responses was based on the following criteria:

1. Only those practices identified as instructional innovations by a majority of the principals were considered in constructing the adoption sub-scales to measure teacher innovativeness.
2. From the group of eligible innovations, only those which, in the judgment of the investigator and a number of colleagues, could be applied to most subject areas were included in the sub-scales.

Number of Items. An attempt was made to include a maximum number of items identified as instructional innovations by the principals. The number of instructional innovations in the adoption scale exceeded fifteen. In this manner the adoption scale constructed satisfied some of the suggestions made by Cartano, Havens, and Rogers (2, p. 82).

Non-Applicable Items. It was recognized that all the instructional innovations in the scale might not be available in many of the schools. The reason for this is that some of the practices or ideas have to become institutional adoptions before they may be considered for individual adoption. For instance, a television receiver needs to be part of the hardware in the school before a classroom teacher is free to adopt or reject the instructional innovation for use in his classroom.

The innovations which do not apply in the case of a particular teacher are of two types: (1) those which are restricted in their general applicability to all subject areas, and (2) those which are not available in a particular school.

These factors were taken into account in the following manner:

1. Those instructional innovations not available to teachers for adoption were accounted for by building a feature into the data collection instrument which would correct for non-availability. This was done by employing two columns--one for checking the innovations adopted and one for checking those available for adoption in the school.

Several of the instructional innovations included in the adoption scale were of the type which each teacher was free to adopt or reject. In other words, these types of innovations do not require institutional adoption. Innovations of this type have the availability column blotted

out with the words "not applicable."

Calculation of Innovativeness Ratios

Innovativeness ratios, I_1, I_2, and I_3, were computed for the individual teacher from each of the adoption sub-scales, 1, 2, and 3, with the following formula:

$$\text{Innovativeness Ratio} \quad \frac{\text{Number of Innovations Adopted}}{\text{Number of Innovations Available for Adoption}}$$

It was assumed that the innovations which dealt with individual differences in part 4 of The Teacher Practices Section were equally available for adoption by all teachers. Therefore the innovativeness ratio, I_4, for the fourth adoption sub-scale was computed by the following formula:

$$\text{Innovativeness Ratio} \quad \frac{\text{Number of Innovations Adopted}}{\text{Total Number of Innovations Listed}}$$

An innovativeness ratio, I_5, was computed for each teacher from the total adoption scale and is equivalent to the sum of the four sub-scales. The computation formula is stated as follows:

$$\text{Innovativeness Ratio} \quad \frac{\text{Total Number of Innovations Adopted}}{\text{Total Number of Innovations Available for Adoption}}$$

IV. COLLECTION OF DATA

The data were collected from junior high school teachers in schools where principals had agreed to assist the researcher in the distribution and collection of the

questionnaires.

Packages containing these questionnaires for collecting teacher data were forwarded to each school principal.

The package to each principal also contained a cover letter for each teacher and stamped self-addressed envelopes to be used in returning questionnaires.

A letter providing the principal with details for distribution, collection and return of the questionnaires was included with the package of questionnaires to each school.

The cover letter to each teacher requested the teacher to (1) complete all parts of the questionnaire, (2) maintain anonymity, (3) enclose the completed questionnaire in the stamped self-addressed envelope, (4) seal the envelope, and (5) return it to the principal as soon as possible.

Each of the stamped self-addressed envelopes carried the name and address of the school from which the return was forwarded. This enabled the investigator to maintain a record of the percentage of returns from each school.

It was hoped that the method of data collection and the anonymity of the questionnaire would encourage a maximum number of replies.

V. INSTRUMENT FOR COLLECTING TEACHER DATA -- INDEPENDENT AND DEPENDENT VARIABLES

The questionnaire designed to gather data from teachers consists of three sections. These are:

1. Personal background information section.
2. Teacher practices section.
3. Attitude section.

Several techniques were incorporated in the data-gathering instrument to make it as impersonal as possible. In addition, the words, adoption, diffusion, and innovation or phraseology using similar words, do not appear in the instrument. It was hoped this might decrease the possibility of receiving biased responses from teachers.

Data for the independent variables were collected by the personal background information section and the attitude section of the instrument. Data for the dependent variables were obtained by the teacher practices section.

Personal Background Information Section

The personal background information section consists of fifteen items (Appendix D). The purpose of this section of the questionnaire was to secure data regarding the independent variables, that is, the characteristics of the sample population. This section solicits the following

information:

1. Sex
2. Marital status
3. Age
4. Years of training
5. Total teaching experience
6. Subject area of specialization
7. Type of school
8. School size
9. Teachers' organization participation
10. Recency of in-service education

Teacher Practices Section

This part of the questionnaire includes the list of practices selected to measure instructional innovativeness --the dependent variable. Essentially, this list of practices consists of twenty-two instructional innovations which comprised four sub-scales designed to measure a specific type of instructional innovativeness. These sub-scales are referred to by the following titles: Instructional Aids (I_1), Technical and Professional Assistants (I_2), Instructional Planning and Organizing Practices (I_3), and Individualizing Instruction (I_4). A brief description of each sub-scale follows.

Instructional Aids (I_1) (5 items). This sub-scale was constructed to determine whether there are differences

among teachers classified by selected personal, situational, and professional factors in the adoption of new instructional aids for classroom instruction. This sub-scale includes the following instructional aids identified as instructional innovations: television, overhead projector, tape recorder, filmstrip or slide projector, and programmed instructional aids.

Technical and Professional Assistants (I_2) (5 items). This sub-scale consists of five innovations introduced in junior high schools to relieve the teacher from non-professional duties and to complement his professional assignment. Items in the sub-scale relate to the use of paraprofessionals or teacher aides, clerical personnel such as typists, consultants or subject supervisors, student guidance personnel and services, and lay persons or outside speakers.

Instructional Planning and Organizing Practices (I_3) (4 items). The instructional innovations in this sub-scale consist of new practices which the teacher may adopt to assist him in organizing and planning the instructional program. Items in I_3 relate to the use of equipment for making instructional transparencies, photocopying machine, resource units, and a filing system of indexed teaching aids or materials.

Individualizing Instruction (I_4) (8 items). The fourth sub-scale focused on instructional innovations

which have been introduced into classrooms to provide for individual differences in the school's program. According to Heathers, educators have long been concerned about providing for individual differences in the school's instructional program, but the greatly increased attention given to individual differences today is one of the hallmarks of the current reform movement (6, p. 27). The instructional innovations of this type are listed in the Teacher Practices Section under the sub-section "Instructional Practices" (Appendix D).

Total Adoption Scale (I_5) (22 items). In addition to the four sub-scale scores a total adoption scale score (I_5) is used in the analyses. This score is calculated from the extent of adoption of the twenty-two innovations comprising the four sub-scales. This scale is referred to as the Total Adoption Scale.

It should be pointed out that the Teacher Practices Section actually contains twenty-eight items. Six of these were distractors.

Attitude Section

The attitude section of the questionnaire consists of Likert-type items from Ratsoy's Education Profession Attitude Questionnaire (Appendix D). Permission to modify the E.P.A.Q. to make it suitable for use on Manitoba teachers was obtained from its developer. Only ten of the

most discriminating items from the E.P.A.Q. were used. The items used were modified according to The Manitoba Teachers' Society Policy Handbook, 1961-62 (12). In addition, those resolutions which have become policy and which are contained in the Minutes of the Forty-seventh Annual General Meeting of Provincial Council (13) constituted another source of policy statements.

Respondents were asked to rate each stimulus item on a five-point scale choosing one of "strongly agree," "agree," "undecided," "disagree," or "strongly disagree." Items were scored on a five-point scale, a value of five being awarded to the most positive alternative, and a value of one to the most negative. Several of the ten items were made antithetical to M.T.S. policy and, therefore, in scoring these were reversed.

Based on official Manitoba Teachers' Society Policy, the attitude section attempted to measure the degree to which the teachers' "professional" attitudes are congruent with the policy statements of The Manitoba Teachers' Society, the provincial teachers' organization for Manitoba teachers.

The "professional" attitude score constituted another independent variable.

VI. OVERVIEW OF THE ANALYSIS

The information on the questionnaires was coded and

recorded on data tabulation sheets. The coded information from the data sheets was then transferred to I.B.M. cards. Scoring, the calculation of innovativeness ratios and the statistical tests were all done by computer.

The statistical tests made included such treatments as one-way analysis of variance, the "t" test, the "F" test, Newman-Keuls procedure for comparison of ordered means, Pearson product-moment correlations, point biserial correlation, and a step-wise form of regression analysis.

The step-wise form of regression analysis was used to study the relationship of a combination of independent variables with the dependent variable. Adjustments were made to take into account possible curvilinear relationships.

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CHAPTER V

DATA AND ANALYSIS PART ONE

This chapter presents data which include a description of the sample, intercorrelations of the dependent and independent variables, a summary of the extent of adoption of the various instructional innovations, frequency distributions of the innovativeness ratios, and a statistical analysis of the sub-scales and the Total Adoption Scale.

I. DESCRIPTION OF SAMPLE

This study was confined to a sample of junior high school teachers teaching in junior high schools or elementary-junior high schools in metropolitan Winnipeg, Manitoba.

The teachers participating in this study represented twenty-two of the twenty-seven junior high schools or elementary-junior high schools in the five school divisions of metropolitan Winnipeg. Four hundred and eighteen questionnaires were forwarded to the twenty-two school principals consenting to co-operate in the distribution and collection of the teacher questionnaires. Three hundred and forty-five questionnaires were returned. This was a return of 83.5 per cent.

Some of the questionnaires were incomplete and

could not be used. The 326 usable questionnaires represented 78 per cent of those mailed out.

The number of participants from each school varied from two to thirty-four. This great variation was due in some measure to the nature of the schools and the willingness of teachers to participate in the study.

Table I summarizes returns from the teachers that comprised the sample.

Personal Variables

Of the 326 teachers in the usable sample, 177 were male and 149 were female. The respondents described as having single status numbered 101, the respondents classified as married numbered 216, and nine were placed in the category accounting for status classified as other than single or married. Table II gives a summary of the frequency distribution of the teachers in the final sample by sex and by marital status.

Table III gives the frequency distribution of the teachers in the sample by age, by number of years of post-secondary education, and by number of years of teaching experience.

Table III shows the teacher ages in eight categories ranging from the category 21 and fewer years to 51 or more years. The age distribution is positively skewed. The amount of post-secondary education they had undertaken ranged from 1 year and less to 7 years or more. The total

TABLE I

SUMMARY OF RETURNS FROM TEACHERS IN THE SAMPLE

	Number	Percentage
Usable questionnaires	326	77.99
Questionnaires not returned	69	16.51
Questionnaires not usable	23	5.50
Totals	418	100.00

TABLE II

FREQUENCY DISTRIBUTIONS OF TEACHERS IN THE SAMPLE BY SEX AND BY MARITAL STATUS

Sex	f	Marital Status	f
Male	177	Single	101
Female	149	Married	216
		Other	9
Totals	326		326

TABLE III

FREQUENCY DISTRIBUTIONS OF AGE, NUMBER OF YEARS OF POST-SECONDARY EDUCATION, AND LENGTH OF TEACHING EXPERIENCE OF TEACHERS IN THE SAMPLE

(N = 326)

Age		Post-Secondary Education		Teaching Experience	
Range in years	f	Range in years	f	Range in years	f
Under 21	4	Less than 1 year	11	1 year or less	38
21 - 25.9	97	1.0 - 1.9	53	2 - 3	68
26 - 30.9	69	2.0 - 2.9	38	4 - 6	48
31 - 35.9	32	3.0 - 3.9	39	7 - 9	43
36 - 40.9	38	4.0 - 4.9	88	10 - 12	27
41 - 45.9	20	5.0 - 5.9	49	13 - 17	31
46 - 50.9	18	6.0 - 6.9	18	18 - 21	22
51 or more	48	7.0 or more	30	22 or more	49
Totals	326		326		326

teaching experience ranged from 1 year or less to 22 years or more. The total teaching experience distribution is positively skewed and shows a tendency to be slightly bimodal.

Situational Variables

Table IV presents the frequency distributions of teachers according to school size and the type of school. There were 230 junior high school teachers who taught in schools where the number of junior high school staff ranged from 25 to 34. The remaining 96 teachers taught in schools where the junior high school staff numbered fewer than 25 teachers.

Teachers classified by type of school fell into one of two categories, elementary-junior high school or junior high school. There were 207 teachers in the sample who taught in schools that offered instruction in grades VII to IX only. The remaining 119 junior high school teachers in the sample taught in elementary-junior high schools.

II. RELATIONSHIPS BETWEEN VARIABLES

Table XXXVI (Appendix E) is an intercorrelation matrix of thirteen independent variables and five dependent variables used in the present study. A probability level of less than or equal to .05 was accepted as indicating a significant relationship between variables.

In addition to the intercorrelation matrix reported

TABLE IV

FREQUENCY DISTRIBUTIONS OF TEACHERS IN THE SAMPLE BY SCHOOL SIZE AND BY SCHOOL TYPE

J.H.S. Staff Size	f	School Type	f
9 and fewer	7	Elementary-Junior High School	119
10 - 14	23	Junior High School	207
15 - 19	45		
20 - 24	21		
25 - 34	230		

in Appendix E several tables of intercorrelations between selected variables are presented below to point out specific relationships pertinent to the problem under study.

Relationships Between Personal and Professional Factors

Table V indicates that teacher's age was significantly correlated with the number of years of post-secondary education and with the length of teaching experience. All of these correlations were in a positive direction. Similarly, the number of years of post-secondary education had a significant positive correlation with the length of total teaching experience. These three variables were all intercorrelated at or beyond the .001 level of significance.

Table VI lists the point biserial correlation coefficients between marital status, a dichotomous variable and three continuous variables, namely age, years of post-secondary education, and total teaching experience. Marital status correlates significantly and positively with each of these three variables.

Relationships Between Situational and Professional Factors

The data in Table VII indicate that the professional variable, years of post-secondary education, was significantly and positively related to the situational factor size. In addition it was noted that the two

TABLE V

INTERCORRELATION MATRIX OF AGE, YEARS OF POST-SECONDARY EDUCATION, AND LENGTH OF TEACHING EXPERIENCE OF TEACHERS IN THE SAMPLE

(N = 326)

Variable	1	2	3
1. Age	1.000	0.350	0.869
2. Years of post-secondary education		1.000	0.271
3. Total teaching experience			1.000

All values were significant at the .001 level

TABLE VI

INTERCORRELATIONS BETWEEN MARITAL STATUS AND AGE, POST-SECONDARY EDUCATION, AND TEACHING EXPERIENCE

(N = 326)

Variable	Correlations
Age	0.214[a]
Years of post-secondary education	0.142[c]
Teaching experience	0.157[b]

[a] indicates significance at the .001 level of confidence.

[b] indicates significance at the .01 level of confidence.

[c] indicates significance at the .05 level of confidence.

TABLE VII

INTERCORRELATION MATRIX OF YEARS OF POST-SECONDARY EDUCATION, SCHOOL SIZE AND TYPE OF SCHOOL

(N = 326)

Variable	1	2	3
1. Years of post-secondary education	1.000	0.157[b]	0.110
2. School size		1.000	0.273[a]
3. Type of school			1.000

[a] indicates significance at the .001 level of confidence.

[b] indicates significance at the .01 level of confidence.

situational factors, size and type of school, were also significantly correlated. Both correlations were at or beyond the .01 level of confidence.

III. EXTENT OF ADOPTION OF INSTRUCTIONAL INNOVATIONS

Tables VIII to XII show the extent of adoption of each of the instructional innovations comprising each of the sub-scales. In addition these tables indicate the per cent adoption of all the innovations constituting a specific sub-scale. Table XII indicates the extent of adoption of all twenty-two innovations which make up the Total Adoption Scale.

A comparison of the extent of adoption of innovations by possible teacher adopters indicates some variation between the sub-scales. The per cent adoption on specific sub-scales ranged from a low of 38 per cent on the use of Individualizing Instruction (I_4) to a high of 50 per cent on the use of Technical and Professional Assistants (I_2). Instructional Planning and Organizing Practices (I_3) were adopted by almost 46 per cent of the possible teacher adopters, and slightly more than 38 per cent of the possible teacher adopters adopted innovations of the Individualizing Instruction (I_4) type. Table XII indicates that the extent of adoption by possible adopters of all twenty-two innovations constituting the Total Adoption Scale is approximately 41 per cent.

TABLE VIII

EXTENT OF ADOPTION OF INSTRUCTIONAL AIDS (I_1) BY TEACHERS IN SAMPLE

Instructional Aids	Number of Teachers Adopting	Number of Possible Adopters	% Adoption
Television	62	276	22.5
Overhead Projector	100	305	35.4
Tape Recorder	117	326	35.9
Filmstrip or Slide Projector	191	326	58.6
Programmed Instructional Aids	36	67	53.7
Total number of adoptions on sub-scale I_1	514		
Total number of possible adoptions on sub-scale I_1		1300	
Total per cent adoption of instructional aids			39.5%

TABLE IX

EXTENT OF ADOPTION OF TECHNICAL AND PROFESSIONAL ASSISTANTS (I_2) BY TEACHERS IN SAMPLE

Technical and Professional Assistants	Number of Teachers Adopting	Number of Possible Adopters	% Adoption
Paraprofessionals or teacher aides	40	57	70.2
Clerical personnel	268	324	82.7
Consultants or subject supervisors	118	172	68.6
Student guidance services	143	318	45.0
Lay persons	35	326	10.7
Total number of adoptions on sub-scale I_2	604		
Total number of possible adoptions on sub-scale I_2		1197	
Total per cent adoption of technical and professional assistants			50.4%

TABLE X

EXTENT OF ADOPTION OF INSTRUCTIONAL PLANNING AND ORGANIZING PRACTICES (I_3) BY TEACHERS IN SAMPLE

Instructional Planning and Organizing Practices	Number of Teachers Adopting	Number of Possible Adopters	% Adoption
Equipment for making instructional transparencies	129	276	46.7
Photocopy machine	152	301	50.5
Resource units	65	81	80.2
Filing system of indexed teaching aids	104	326	31.9
Total number of adoptions on sub-scale I_3	450		
Total number of possible adoptions on sub-scale I_3		984	
Total per cent adoption of instructional planning and organizing practices			45.7%

TABLE XI

EXTENT OF ADOPTION OF INDIVIDUALIZING INSTRUCTION (I_4) BY TEACHERS IN SAMPLE

Individualizing Instruction	Number of Teachers Adopting	% Adoption
Team Teaching	47	14.4
Ability grouping within the classroom	86	26.4
Differentiated assignments for different students within the same classroom based on their special needs and interests	113	34.7
Regrouping of students within the classroom to accommodate to their different learning rates	77	23.6
Class organized in such a way that individuals and groups with different abilities can move ahead more rapidly or go more slowly than others	92	28.2
Provision was made for individual students to pursue projects of their own choosing	172	52.8
Provision was made for students to work in small groups	205	62.8
Discovery or inquiry method used for classroom instruction	210	64.4
Total number of adoptions on I_4	1002	
Total number of possible adoptions on I_4	2608	
Total per cent adoption of individualizing instruction		38.4%

Note: Number of possible adopters for each instructional innovation was 326.

TABLE XII

EXTENT OF ADOPTION OF TWENTY-TWO INSTRUCTIONAL INNOVATIONS BY TEACHERS IN SAMPLE

	Number of Teachers Adopting	Number of Possible Adopters	% Adoption
Twenty-two instructional innovations on Total Adoption Scale (I_5)	2570	6089	42%

This variation in the extent of adoption of instructional innovations between the different sub-scales suggests the following question about the innovations in the present study. Why are some types of instructional innovations adopted to a greater extent than others? An examination of the instructional innovations in each of the sub-scales suggests a plausible answer. The instructional innovations making up sub-scales I_1, I_3 and I_4 deal with "things," ideas or practices. The innovations constituting I_2, on the other hand, deal with people. It is possible that this basic difference might account for the variation. Perhaps the innovations constituting I_2, that is, the technical and professional personnel, act as change agents on their own behalf and therefore promote their own adoption by others. Also it is possible that people, that is, teachers, view people (technical and professional assistants) differently than they view "things," ideas or practices.

Another approach is to explain this variation by focusing on the characteristics of the innovations. Rogers has utilized five characteristics of innovations, namely relative advantage, compatibility, complexity, divisibility, and communicability in order to explain variation in adoption (4, p. 124).

Carlson, however, compared the varying rates of diffusion or spread of such innovations as programmed

instruction, team teaching and modern math and concluded that "varying rates of diffusion of educational innovations are only partially accounted for by the five characteristics of innovations" (1, p. 73). Nevertheless, Rogers suggests that "it is the potential adopter's perceptions of the compatibility, complexity, divisibility, and communicability of the innovation that affect its rate of adoption" (4, p. 124).

According to Miller a more recent position taken by Rogers to explain variation in adoption concerns the consequences of the innovations. Rogers maintains that adoption varies because consequences of innovation in education such as educational quality, greater pupil achievement, and dissatisfaction among school staff, influence the adoption by individuals or school systems (3, pp. 379-380).

The barriers to change in education suggest another explanation for this variation. The barriers cited by Miles appear relevant (2, p. 634). Such reasons as the lack of change agents to actively promote the adoption of certain new instructional ideas, the absence of valid scientific research findings, and the lack of economic incentive or immediate economic payoff by certain types of instructional innovations might account for the variation in the extent of adoption of the innovations under investigation in the present study.

The comparison of the extent of adoption of individual instructional innovations such as the overhead projector with the extent of adoption of the movie projector, an instructional aid not identified as an innovation by principals, suggests another reason. Table XIII indicates that the percentage adoption of the movie projector for classroom instruction is almost twice the percentage adoption of the overhead projector. The overhead projector is a relatively new instructional aid to be introduced into schools. The movie projector, on the other hand, was introduced relatively earlier. It would appear that time might be a factor accounting for variation in adoption. In addition it probably takes less teacher effort to "show a movie" than to prepare transparencies and then teach using them.

IV. FREQUENCY DISTRIBUTIONS OF INNOVATIVENESS RATIOS

The frequency distributions of innovativeness ratios for all sub-scales is seen in Tables XIV, XV, XVI, and XVII.

Table XIV indicates that the distribution of the innovativeness ratios derived from the Instructional Aids sub-scale (I_1) tended to be normally distributed and positively skewed. This sub-scale (I_1) had a mean innovativeness ratio of 0.39.

Table XV indicates that the distribution of the

TABLE XIII

A COMPARISON OF THE EXTENT OF ADOPTION BETWEEN AN INSTRUCTIONAL INNOVATION AND A NON-INNOVATION BY TEACHERS IN SAMPLE

Variable	Number of Teachers Adopting	Number of Possible Adopters	% Adoption
Instructional innovation (overhead projector)	108	305	35.4
Non-innovation (movie projector)	200	326	61.3

innovativeness ratios obtained from the Technical and Professional Assistants sub-scale (I_2) is positively skewed and tends to be bi-modal. The mean innovativeness ratio of this distribution was 0.49.

Similarly Table XVI indicates that the distribution of the innovativeness ratios obtained from the Instructional Planning and Organizing Practices sub-scale (I_3) tends to be bi-modal. The mean innovativeness ratio obtained on I_3 was 0.44.

Table XVII shows that the distribution of the innovativeness ratios for Individualizing Instruction sub-scale (I_4) is positively skewed and tends to be bi-modal. The mean innovativeness ratio, 0.38, is the lowest mean of the four sub-scales.

The innovativeness ratios for the Total Adoption Scale (I_5) were approximately normally distributed, but the distribution was positively skewed as is seen in Table XVIII. The mean innovativeness ratio for the Total Adoption Scale was 0.42.

V. RELATIONSHIPS BETWEEN SUB-SCALES, TOTAL ADOPTION SCALE AND SUB-SCALE ITEMS

The correlation between sub-scales and the Total Adoption Scale in Table XIX appears to lend support to the use of sub-scales. The diagonal matrix of intercorrelations in Table XIX indicates that these sub-scales tended

TABLE XIV

DISTRIBUTION OF THE INNOVATIVENESS RATIOS ON INSTRUCTIONAL AIDS SUB-SCALE (I_1)

(N = 326)

Innovativeness ratios[a]	f
0.81 - 1.00	13
0.61 - 0.80	59
0.41 - 0.60	71
0.21 - 0.40	110
0.00 - 0.20	73
Mean = 0.39	S.D. = 0.28

[a] Innovativeness ratio $= \frac{\text{Number of Innovations Adopted}}{\text{Number of Innovations Available for Adoption}}$

TABLE XV

DISTRIBUTION OF THE INNOVATIVENESS RATIOS ON TECHNICAL AND PROFESSIONAL ASSISTANTS SUB-SCALE (I_2)

(N = 326)

Innovativeness ratios[a]	f
0.81 - 1.00	23
0.61 - 0.80	96
0.41 - 0.60	67
0.21 - 0.40	104
0.00 - 0.20	36
Mean = 0.49	S.D. = 0.26

[a] $\text{Innovativeness ratio} = \frac{\text{Number of Innovations Adopted}}{\text{Number of Innovations Available for Adoption}}$

TABLE XVI

DISTRIBUTION OF THE INNOVATIVENESS RATIOS ON INSTRUCTIONAL PLANNING AND ORGANIZING PRACTICES SUB-SCALE (I_3)

(N = 326)

Innovativeness ratios[a]	f
0.81 - 1.00	43
0.61 - 0.80	82
0.41 - 0.60	26
0.21 - 0.40	90
0.00 - 0.20	85
Mean = 0.44	S.D. = 0.34

$$^{a}\text{Innovativeness ratio} = \frac{\text{Number of Innovations Adopted}}{\text{Number of Innovations Available for Adoption}}$$

TABLE XVII

DISTRIBUTION OF THE INNOVATIVENESS RATIOS ON INDIVIDUALIZING INSTRUCTION SUB-SCALE (I_4)

(N = 326)

Innovativeness ratios[a]	f
0.81 - 1.00	25
0.61 - 0.80	50
0.41 - 0.60	40
0.21 - 0.40	135
0.00 - 0.20	76
Mean = 0.38	S.D. = 0.25

[a] Innovativeness ratio = $\frac{\text{Number of Innovations Adopted}}{\text{Total Number of Innovations Listed}}$

TABLE XVIII

DISTRIBUTION OF THE INNOVATIVENESS RATIOS ON THE TOTAL ADOPTION SCALE (I_5)

(N = 326)

Innovativeness ratios[a]		f
0.81 - 1.00		7
0.61 - 0.80		49
0.41 - 0.60		114
0.21 - 0.40		121
0.00 - 0.20		35
Mean 0.42	S.D.	0.18

[a] $\text{Innovativeness ratio} = \frac{\text{Total Number of Innovations Adopted}}{\text{Total Number of Innovations Available for Adoption}}$

to measure different types of instructional innovativeness.

Presented in Table XIX are the correlation coefficients and the shared predictability of the four subscales and the total scale. The underlined numbers are the correlation coefficients and, in each case, the number in parentheses is the shared predictability. To illustrate, the correlation coefficient between I_3 and I_5 is .612. This means there is a commonality of approximately 37 per cent between these two measures, I_3 and I_5. In other words, I_3 and I_5 have a relatively low correlation with each other. This suggests that each probably measures a separate dimension of instructional innovativeness.

Similarly in examining the correlation between the innovativeness ratio on sub-scale I_1 and on sub-scale I_3 a correlation coefficient of .277 is evident. Although these results are significant beyond the .001 level of confidence the sub-scales have a relatively low correlation with each other. This significant but negligible relationship indicates that the separate sub-scales appear to measure different types of instructional innovativeness.

These findings are seen as supporting the use of sub-scales to measure the adoption of new instructional practices.

TABLE XIX

INTERCORRELATION MATRIX OF SUB-SCALE INNOVATIVENESS RATIOS AND TOTAL ADOPTION SCALE INNOVATIVENESS RATIOS

(N = 326)

	I_1	I_2	I_3	I_4	I_5
1. Instructional Aids - I_1	1.000	0.114[b] (1.29%)*	0.277[a] (7.67%)*	0.219[a] (4.79%)*	0.580[a] (33.64%)*
2. Technical and Professional Assistants - I_2		1.000	0.209[a] (4.36%)*	0.126[b] (1.58%)*	0.467[a] (21.8 %)*
3. Instructional Planning and Organizing Practices - I_3			1.000	0.265[a] (7.02%)*	0.612[a] (37.45%)*
4. Individualizing Instruction - I_4				1.000	0.793[a] (62.88%)*
5. Total Adoption Scale - I_5					1.000

[a] indicates significance at the .001 level of confidence.

[b] indicates significance at the .05 level of confidence.

*Percentages indicate relative predictability between scale scores.

The intercorrelation tables (XXXVII to XL) included in Appendix F show the correlation between item and sub-scale innovativeness ratios and the Total Adoption Scale innovativeness ratio. All but two items making up the respective sub-scales correlate significantly at or beyond the .05 level with their respective sub-scale innovativeness ratios. The two items which do not correlate significantly with the innovativeness ratio are found in Table XL. These tables (XXXVII to XL) report the relative predictability between the innovativeness ratio of a particular sub-scale and the respective items of the sub-scale. These tables also show the relative predictability between the Total Adoption Scale innovativeness ratio and each of the items.

The data in Table XL indicates that the correlation between the Individualizing Instruction sub-scale items and the innovativeness ratio I_4 is negligible. These items, however, do correlate with the innovativeness ratio I_5; this correlation is substantial when compared with the relationship between the sub-scale items and I_4. These findings suggest that perhaps these items are not additive for the calculation of the innovativeness ratio I_4.

An examination of the type of items composing the Individualizing Instruction sub-scale suggests a plausible explanation which may account for the suggested non-additive property of the items. To illustrate, the items of

this sub-scale may be classified as innovations involving grouping techniques. The items of the other three sub-scales, on the other hand, appear to represent resource innovations. It is plausible that since these items represent technique innovations and because many of these technique innovations may accomplish the same purpose, a teacher would not necessarily need to adopt all these techniques to be considered highly innovative.

In general, it may be concluded that most of the 22 instructional innovations composing the Total Adoption Scale appear to measure instructional innovativeness of a general nature. In addition it may be concluded that several of the sub-scales, namely, Instructional Aids, Technical and Professional Assistants, and Instructional Planning and Organizing Practices, appear to measure specific types of instructional innovativeness. The correlations between the Individualizing Instruction sub-scale items and the innovativeness ratio I_4 do not appear to warrant a similar conclusion. The correlations between I_5 and these items do, however, appear to indicate that these items contribute to the measurement of a general type of instructional innovativeness. This suggests a need to refine the Individualizing Instruction sub-scale.

VI. SUMMARY

This chapter describes the personal, situational

and professional characteristics of teachers in the sample by presenting the frequency distributions of several of the variables used in the study. The sample contained approximately an equal number of male and female teachers. About two-thirds of the teachers were married. The description of the sample by age and length of teaching experience indicated that the distributions of teachers according to each of these variables tended to be positively skewed. Approximately one-third of the teachers taught in schools where the junior high school staff numbered fewer than 25 teachers. Similarly about one-third of the junior high school teachers taught in elementary-junior high schools. Slightly more than half the teachers in the sample had 3-5 years of post-secondary education.

The present chapter also included a description of the relationships existent between variables for members of the sample. The data indicated a substantial relationship between two personal variables, age and length of teaching experience.

The data indicated some variation in the extent of adoption of instructional innovations by the teachers in the sample. The Individualizing Instruction (I_4) innovations were adopted by the smallest percentage of teachers; Technical and Professional Assistants (I_2) innovations were adopted by the largest percentage of teachers. The data also reported the extent of adoption of each specific

innovation. Team teaching was adopted by the smallest percentage of teachers. The use of clerical personnel, on the other hand, was adopted by the largest percentage of teachers.

Frequency distributions of the innovativeness ratios were reported in this chapter. These distributions provided a description of the innovativeness of teachers in the sample in terms of the measure used to assess instructional innovativeness in the present study. Finally, this chapter also included a description of the relationships existent between the innovativeness ratios.

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CHAPTER VI

DATA AND ANALYSIS PART TWO: PERSONAL AND SITUATIONAL FACTORS

The major purpose of the study was to determine whether a relationship exists between the instructional innovativeness of junior high school teachers and certain characteristics of these teachers. The teacher characteristics examined represented two major types; one set included personal and situational factors and another set consisted of professional factors.

In Chapter III hypotheses, based on research findings, were formulated. Hypotheses 1, 2, 3, 4, 5, and 6 are concerned principally with the effort to determine correlates between personal and situational factors and the instructional innovativeness of junior high school teachers. In the present chapter these six hypotheses are stated, the method of testing them described, and the results of the tests presented.

The hypotheses were tested on each of five innovativeness ratios. Since the dependent variables are continuous variables, differences between categories of each of the personal and situational factors were sought by the one-way analysis of variance technique. The critical level of significance for the *F* ratio was set *a priori* at .05. Where comparisons of two means following a significant *F*

ratio were thought necessary, a t test was applied. However, on several occasions a comparison of three or more means following a significant F ratio was required. In these cases the Newman-Keuls comparison method of ordered means as described in Winer (2, pp. 80-85) was used.

I. SEX AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 1 states that junior high school teachers classified on the basis of sex differ significantly in instructional innovativeness.

Hypothesis 1: Junior high school teachers classified on the basis of sex differ significantly in instructional innovativeness.

Findings. In Table XX are reported the mean innovativeness ratios of male and female teachers. Significant F ratios were obtained on two adoption sub-scales. Male teachers scored significantly higher than female teachers on sub-scales I_1 and I_3. The first sub-scale, I_1, dealt with the adoption of instructional aids such as television, overhead projector, and programmed instructional aids. The sub-scale, I_3, consisted of items such as equipment for making instructional transparencies, photocopying machine, instructional resource units and filing system of indexed teaching aids. The latter group constitutes instructional innovations which assist the classroom teacher to plan and organize the instructional program.

TABLE XX

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY SEX OF RESPONDENT

	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Male	177	.42	.48	.47	.38	.43
Female	149	.35	.50	.39	.38	.40
t		2.31	0.60	2.17	0.00	1.27
Significance		.05	NS	.05	NS	NS

On both of these sub-scales, I_1 and I_3, men scored significantly higher than women. The other sub-scales, I_2 and I_4, and also the Total Adoption Scale, I_5, did not reveal significant differences in instructional innovativeness between the sexes.

Discussion. The significant differences between the males and females indicated by the sub-scale scores, I_1 and I_3, might be expected since both of these sub-scales tap instructional innovativeness of a mechanical nature. All of the five items in I_1 are of a mechanical nature and half of those in I_3 are of a similar nature. It is recognized that sex differences with respect to mechanical inclination do exist. The present finding is, therefore, in agreement with the sex differential in adoption noted by Barnett (supra, p. 34).

This finding appears to indicate that the decision to adopt certain instructional innovations may be a function of the inclination of a particular sex for a particular innovation. This finding would appear to support Barnett's contention concerning differences between the sexes in adoption of innovations. He points out that the predispositions which do appear towards adoption of certain innovations are a function of cultural variables (supra, p. 34). The evidence in the present study appears to confirm Barnett's position.

The lack of significant differences in sub-scales,

I_2 and I_4, indicates that the sexes do not differ significantly in all types of instructional innovativeness. Again Barnett's viewpoint that these differences do not occur in all contexts but in only specific ones appears to account for lack of differences on all types of innovations (supra, p. 34).

II. MARITAL STATUS AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 2: Junior high school teachers classified on the basis of marital status differ significantly in instructional innovativeness.

Findings. Table XXI compares the mean innovativeness ratios of single and married teachers. There were no significant differences between the two categories of marital status on any of the four sub-scales or the Total Adoption Scale.

Discussion. The mean scores of the single teachers were the same or similar to the category of teachers referred to as married. This latter group contained 222 teachers, 213 of these were married teachers and the remaining nine were classified as having been married.

These findings support rejection of the hypothesis and demonstrate that for this sample no relationship exists between marital status and instructional innovativeness as it was measured in the present study. The evidence of the present study appears to confirm Mort and Cornell's finding that marital status is not a factor

TABLE XXI

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY MARITAL STATUS

	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Single	104	.39	.49	.42	.39	.42
Married	222	.39	.49	.44	.38	.42
t		0.10	0.10	0.04	0.03	0.10
Significance		NS	NS	NS	NS	NS

influencing innovativeness (supra, p. 42).

Since significant differences were not found between the two marital status categories on any of the scales, hypothesis 2 was rejected. These findings indicate that for this sample marital status is not a correlate of instructional innovativeness as measured in the present study.

III. AGE AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 3: Junior high school teachers classified on the basis of age differ significantly in instructional innovativeness.

Findings. The results of tests of differences between three age groups of junior high school teachers are presented in Table XXII. Three of the F ratios computed on the data for these teachers were significant. The Newman-Keuls comparison test of ordered means was applied and the test showed significance at the .01 level between the middle age category and the oldest age category on the sub-scales I_1 and I_3. The Newman-Keuls comparison indicated significance at the .05 level between the middle age group and the oldest group on the Total Adoption Scale I_5. In all three cases the means of the middle age group were highest, following this was the youngest age group and the means of the oldest age group were lowest.

Discussion. Three of the five analyses of variance

TABLE XXII

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY AGE OF RESPONDENT

Group	Age	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
I	25 and under	101	.38	.49	.42	.39	.41
II	26 - 40	139	.44	.50	.50	.39	.45
III	41 and more	86	.33	.49	.35	.38	.38
	F ratio		4.74	0.06	6.00	0.08	3.20
	Significance		.01	NS	.01	NS	.05
	Sign. Diff. Groups		II and III		II and III		II and III

revealed significant differences between junior high school teachers comprising different age groups. The findings on these three analyses are consistent with the evidence reported by Ross, that is, that the relationship between age and innovativeness is curvilinear rather than linear (_supra_, p. 44).

As indicated in Table XXII, instructional innovativeness appears to increase with age. However, this relationship does not seem to hold true for all ages. The middle years appear to be the peak and beyond these years instructional innovativeness appears to decrease with increasing age.

The data for the present study suggests that the decision to adopt certain instructional innovations is a function of age. There may be a plausible explanation for this. For instance, the finding that the means of the youngest age group on I_1, I_3 and I_5 are lower than the means of the middle age group suggests that the former category has needs which differ from the latter. It is probable that the youngest age group would give priority to such needs as gaining knowledge of the subject matter. A concern for the satisfaction of this need would cause the younger inexperienced teacher to postpone adoption decisions until needs demanding priority were adequately satisfied.

One explanation which may account for the fact that

the oldest age group in the present study is least innovative is the group's orientation. Rogers explains this relationship by stating that the young are less conditioned by the older culture; hence, they are more innovative (supra, p. 31).

Finally, it is noted that the middle age category is significantly more innovative on two of the sub-scales than the oldest age group. This difference may be explained by the fact that the middle age group is committed to a number of years in the teaching career before retirement, this factor coupled with the likelihood of greater stamina and energy would tend to make the middle age group more innovative than the oldest age group.

IV. TEACHING EXPERIENCE AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 4: Junior high school teachers classified by years of teaching experience differ significantly in instructional innovativeness.

Findings. Table XXIII compares the mean innovativeness ratios obtained by teachers classified by years of teaching experience. Significant differences were found on two sub-scales, namely Instructional Aids (I_1) and Instructional Planning and Organizing Practices (I_3). A significant difference was also found on the Total Adoption Scale (I_5). In all three cases the teachers with 7-17 years of teaching experience had a significantly

TABLE XXIII

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY YEARS OF TEACHING EXPERIENCE

Group	Experience	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
I	6 years and less	154	.37	.48	.43	.38	.41
II	7 - 17 years	101	.45	.51	.50	.40	.45
III	18 or more years	71	.35	.49	.36	.37	.39
	F ratio		3.69	0.38	3.85	0.42	3.46
	Significance		.05	NS	.05	NS	.05
	Sign. Diff. Groups		I and II II and III		II and III		II and III

higher mean innovativeness ratio than the group with 18 or more years of experience. Also on the sub-scale I_1 the group with 7-17 years of experience had a significantly higher mean innovativeness ratio than the group with 6 or fewer years of experience.

In all the analyses except the treatment concerning I_2 the ordering of the means was the same. The teacher group with 7-17 years experience was most innovative; following this was the 6 and less years experience group; and the group with the most years of teaching experience (18 or more) was least innovative.

Discussion. The results reported in Table XXIII are not surprising when these findings are compared to the findings reported in Table XXII. The findings concerning experience are almost identical to the evidence found with regard to age. Furthermore, it should be pointed out that age and experience correlate highly; the correlation between these variables in the present study was 0.869 (*supra*, p. 101).

The significant differences found on three of the five analyses appear to support the conclusion that there is a tendency for teachers with the longest teaching experience record to be the most conservative group in the adoption of new instructional practices.

V. TYPE OF SCHOOL AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 5: Junior high school teachers classified by type of school differ significantly in instructional innovativeness.

Findings. Table XXIV compares the mean innovativeness ratios of junior high school teachers who teach in junior high schools and junior high school teachers who teach in elementary-junior high schools. Junior high school teachers teaching in junior high schools scored significantly higher on two sub-scales, Instructional Aids (I_1) and Individualizing Instruction (I_4), and on the Total Adoption Scale (I_5). There were no significant differences on the other two sub-scales, Technical and Professional Assistants (I_2) and Instructional Planning and Organizing Practices (I_3).

Discussion. The finding that junior high school teachers teaching in junior high schools scored significantly higher than junior high school teachers in elementary-junior high schools on three of these scales might be explained in part by the correlations reported in Table VII (*supra*, p. 103). Table VII indicates a significant correlation between junior high school staff size and type of school. Size has been shown to be positively related to innovativeness in several research studies (*supra*, pp. 53-54), and also Rogers' theory supports a positive relationship between a situational factor such as size and

TABLE XXIV

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY TYPE OF SCHOOL

	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Elementary-junior high school teachers	119	.35	.47	.40	.32	.37
Junior high school teachers	207	.42	.51	.45	.42	.45
t		2.23	1.24	1.27	3.49	3.59
Significance		.05	NS	NS	.001	.001

innovativeness (supra, p. 53). The correlation between size and type suggests a possible explanation for the present findings.

Another possible explanation to account for these differences in innovativeness might lie in the different degrees of specialization by the teachers in the two types of schools. It is reasonable to assume that junior high school teachers in junior high schools tend to specialize more than junior high school teachers in elementary-junior high schools. According to Rogers the degree of specialization is positively related to innovativeness (1, p. 177).

VI. SCHOOL SIZE AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 6: Junior high school teachers classified by school size differ significantly in instructional innovativeness.

Findings. Table XXV compares the mean innovativeness ratios of teachers classified according to the number of junior high school staff members. Only one of the five _F_ ratios was significant beyond the .02 level. The significant difference was found on the sub-scale, Individualizing Instruction--I_4. In this case the mean innovativeness ratio of teachers who taught in schools with twenty-five or more junior high school teachers was higher than that of teachers who taught in schools with fewer than twenty-five junior high school staff members.

TABLE XXV

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY SCHOOL SIZE

School Size	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Fewer than 25 J.H.S. teachers	96	.39	.51	.46	.33	.40
More than 25 J.H.S. teachers	230	.39	.49	.42	.41	.42
t		0.14	0.61	0.92	2.39	0.93
Significance		NS	NS	NS	.02	NS

Discussion. The research evidence reported in Chapter III indicated that a situational factor such as size is related to innovativeness (supra, p. 53). Similarly Rogers' Adoption Theory supports a positive relationship between size and innovativeness. Because only one of the analyses was significant there is insufficient evidence in the present study to indicate such a relationship.

VII. SUMMARY AND CONCLUSIONS

Table XXVI summarizes the findings related to Hypotheses 1 to 6. Hypothesis 1 was partially supported on two sub-scales. In these cases it was found that male teachers were significantly more innovative than female teachers on Instructional Aids (I_1) and Instructional Planning and Organizing Practices (I_3). There was no difference between the sexes on the adoption of the innovations included in the two other sub-scales, namely Technical and Professional Assistants (I_2) and Individualizing Instruction (I_4). Also no difference was found on the Total Adoption Scale (I_5).

Hypothesis 2 was totally rejected. None of the four sub-scales or the Total Adoption Scale showed any significant F ratios. It was concluded that marital status is not a correlate of instructional innovativeness as measured by the instruments used in the present study.

Hypothesis 3 was substantially supported on two of the sub-scales and on the total scale. Two of the differences were significant at the .01 level. The results indicate that the middle age group (26-40 years) was significantly more innovative than the oldest age group (41 or more years). There were no differences between the middle age group and the youngest age group.

Hypothesis 4 was substantially supported on three of the five analyses. All three significant differences were beyond the .05 level. The analysis reveals that the middle experience group (7-17 years) was significantly more innovative than the group with 18 or more years of teaching experience on I_1, I_3 and I_5. The middle group was also significantly more innovative than the group with 6 years or fewer on I_1, Instructional Aids.

Hypothesis 5 was substantially supported on three of the five analyses. Two of the significant differences occurred beyond the .001 level. In all three cases junior high school teachers teaching in junior high schools had significantly higher mean innovativeness ratios than junior high school teachers teaching in elementary-junior high schools. The discriminating scales included Instructional Aids (I_1), Individualizing Instruction (I_4) and the Total Adoption Scale (I_5).

Finally, Hypothesis 6 was tentatively rejected. Only one significant difference in instructional

innovativeness was found when teachers were classified by school size. In this case teachers teaching in schools where the junior high staff numbered 25 or more had a significantly higher mean innovativeness ratio on subscale I_4 than teachers from schools where the staff numbered fewer than 25 teachers.

The results of these analyses appear to support at least partly Rogers' Adoption Theory. In the present study of junior high school teachers, both personal factors and situational factors appear to be related to instructional innovativeness. That is, on the six hypotheses under investigation in this part of the study, three were substantially supported, one accepted in part, and two were tentatively rejected.

TABLE XXVI

SIGNIFICANCE OF F RATIOS RELATED TO HYPOTHESES BASED ON PERSONAL AND SITUATIONAL FACTORS OF J.H.S. TEACHERS

Hypothesis	Adoption Sub-Scales I_1	I_2	I_3	I_4	Adoption Scale I_5	Number of Significant F ratios & Decision
1 (Sex)	.05	NS	.05	NS	NS	2 Accepted in Part
2 (Marital Status)	NS	NS	NS	NS	NS	0 Tentatively Rejected
3 (Age)	.01	NS	.01	NS	.05	3 Substantially Accepted
4 (experience)	.05	NS	.05	NS	.05	3 Substantially Accepted
5 (Type of School)	.05	NS	NS	.001	.001	3 Substantially Accepted
6 (School Size)	NS	NS	NS	.02	NS	1 Tentatively Rejected
Total Significant F ratios by Scale	4	0	3	2	3	

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CHAPTER VII

DATA AND ANALYSIS PART THREE: PROFESSIONAL FACTORS

In Chapter VI of this study six hypotheses that there are differences in instructional innovativeness among groups of junior high school teachers classified by such selected personal and situational factors as sex, marital status, age, total teaching experience, type of school, and size of junior high school staff were tested. Significant differences in means were found in five of the six hypotheses tested. Chapter VII presents for testing five hypotheses which focus on the professional characteristics of teachers. Three sub-hypotheses form the basis for the empirical test of Hypothesis 9.

I. POST-SECONDARY EDUCATION AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 7: Junior high school teachers classified by the number of years of post-secondary education differ significantly in instructional innovativeness.

Findings. The results of tests of differences in instructional innovativeness between junior high school teachers classified by number of years of post-secondary education are shown in Table XXVII. Significant _F_ ratios were obtained on two sub-scales, I_1 and I_3, and the Total Adoption Scale - I_5. In all three cases the middle group

TABLE XXVII

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY NUMBER OF YEARS OF POST-SECONDARY EDUCATION

Group	Number of Years Post-Secondary Education	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
I	2 and fewer	154	.37	.48	.43	.38	.41
II	3 - 5	101	.45	.51	.50	.40	.45
III	6 or more	71	.35	.49	.36	.37	.39
	F ratio		3.69	0.38	3.85	0.42	3.46
	Significance		.05	NS	.05	NS	.05
	Sign. Diff. Groups		I and II II and III		II and III		II and III

with 3-5 years of post-secondary education had the highest innovativeness ratio when means were compared two at a time.

On all five scales except I_2 the ordering of the means was the same. The group with 3-5 years was most innovative; following this was the group with 2 years or fewer and the group with the most years (6 or more) of post-secondary education was least innovative.

Discussion. The findings of the present study appear to support Ross' earlier findings that the relationship between innovativeness and amount of education is a curvilinear one (supra, p. 55). The data in Table XXVII indicate that in the present study a similar relationship exists.

II. RECENCY OF IN-SERVICE EDUCATION AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 8: Junior high school teachers classified on the basis of recency of in-service education differ significantly in instructional innovativeness.

Findings. The results of tests of differences between junior high school teachers classified by the recency of in-service education are presented in Table XXVIII. A significant F ratio was obtained on only one sub-scale, namely, I_1 which deals with instructional aids. The Newman-Keuls comparison test of ordered means indicated that the means of two of the categories representing

TABLE XXVIII

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY RECENCY OF IN-SERVICE EDUCATION

Group	Recency of In-Service Education	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
I	1966-67	288	.40	.49	.44	.39	.42
II	1964-66	25	.43	.58	.38	.32	.40
III	Prior to 1964 or did not participate	13	.19	.44	.35	.39	.36
	_F_ ratio		3.76	1.79	0.90	0.89	0.94
	Significance		.01	NS	NS	NS	NS
	Sign. Diff. Groups		I and III II and III				

the more recent in-service education program participation were significantly different from the category containing individuals with the least recent in-service education and the non-participants. In both cases the means of the more recent in-service education groups were considerably higher to produce results significant at the .01 level.

The remaining sub-scales and the Total Adoption Scale failed to discriminate between different categories on recency of in-service education.

Discussion. The research evidence presented in Chapter III indicated that recency of in-service education is a factor related to innovativeness. However, four of the five scales in the present study failed to discriminate between the different categories. Furthermore there is no distinct progression in mean scores as the categories from the most recent to the least recent are considered. It may be that these results have little meaning because of the disproportionate representation of individuals in two of the categories as compared with the numbers in the category of most recent in-service education.

Because of the inability of four of the scales to discriminate between the categories, and because two categories contain less than one-tenth of the present sample, this casts doubt on the usefulness of the variable recency of in-service education in the present study.

III. PROFESSIONAL PARTICIPATION AND INSTRUCTIONAL INNOVATIVENESS

The general hypothesis 9 states that there are differences in instructional innovativeness between junior high school teachers classified on the basis of participation and non-participation in professional teacher organization activities. Three types of professional participation, namely, attendance of division association meetings, participation in division association activities, and participation in provincial teachers' organization activities were selected for testing this hypothesis. The results are presented separately for each type of professional participation under sub-hypotheses 9.1 to 9.3 below.

Sub-hypothesis 9.1: Junior high school teachers classified on the basis of frequency of attendance at division association meetings differ significantly in instructional innovativeness.

Findings. Table XXIX compares the mean scores on the five innovativeness scales for three levels of attendance at division association meetings. No significant F ratios were obtained in any of the five cases, namely I_1, I_2, I_3, I_4, and I_5. In addition no consistent pattern was evident in the ordering of the means.

Discussion. The results of the analyses did not support the sub-hypothesis 9.1 on any of the five scales, hence this sub-hypothesis was rejected. In the present

TABLE XXIX

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY FREQUENCY OF ATTENDANCE AT DIVISION ASSOCIATION MEETINGS

Frequency of Attendance at Div. Assoc. Meetings	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
All or most	110	.41	.46	.46	.39	.42
Few	95	.39	.53	.47	.37	.43
None	121	.37	.49	.39	.39	.41
_F_ ratio		0.46	1.61	1.92	0.36	0.23
Significance		NS	NS	NS	NS	NS

study no relationship exists between the variable, frequency of division association meeting attendance, and instructional innovativeness. This finding appears to contradict Brickell's conclusion (_supra_, p. 61). Perhaps more refinement of the instrument used to obtain information relative to the variable under consideration is needed to discriminate between these categories of meeting attendance. On the other hand it may be that divisional association meetings focus largely on matters that might be referred to as teacher welfare and that little time is devoted to "professional" development activities which are considered to assist in the promotion of innovation.

Nevertheless, since the data did not reveal significant differences, it was concluded that in the present study the frequency of attendance at division association meetings is not a correlate of instructional innovativeness.

Sub-hypothesis 9.2: Junior high school teachers classified by participation or non-participation in activities at the divisional level differ significantly in instructional innovativeness.

Findings. Table XXX presents the results of tests of differences between means of participating teachers and means of non-participating teachers. One _F_ ratio indicates a difference, significant at the .02 level of confidence, on the sub-scale, I_4, which deals with classroom innovations emphasizing the individualization of instruction.

TABLE XXX

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY PARTICIPATION OR NON-PARTICIPATION IN DIVISIONAL ASSOCIATION ACTIVITIES

	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Participants	29	.40	.45	.52	.48	.47
Non-participants	297	.39	.50	.43	.37	.41
t		0.10	0.87	1.51	2.24	1.50
Significance		NS	NS	NS	.05	NS

The sub-scales I_1, I_2, and I_3 and the total scale, I_5, did not discriminate between the two groups of teachers classified by participation or non-participation in divisional association activities.

Discussion. Although only one of the five tests of differences in instructional innovativeness was found in testing sub-hypothesis 9.2, a trend appears evident when the mean scores of the two groups are compared. In four of five cases the mean innovativeness ratios of the participants were greater than the mean scores of the non-participants.

The data in Table XXX indicate that participants tend to be more innovative than non-participants as a whole. However, it is not clear whether this type of participation accounts for higher instructional innovativeness. Perhaps it is the more innovative teacher who is attracted to such division association activities or elected to executive positions.

Sub-hypothesis 9.3: Junior high school teachers classified by participation or non-participation in activities at the provincial level differ significantly in instructional innovativeness.

Findings. Table XXXI presents the results of analyses of variance performed on the participant and non-participant group means in each of the four adoption sub-scales and the Total Adoption Scale. In all five cases those who held positions on the provincial teachers'

TABLE XXXI

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY PARTICIPATION OR NON-PARTICIPATION IN PROVINCIAL ORGANIZATION ACTIVITIES

	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Participants	24	.42	.50	.49	.52	.49
Non-participants	302	.39	.49	.43	.37	.41
t		0.55	0.14	0.87	2.81	2.14
Significance		NS	NS	NS	.01	.05

organization executive or committees had higher mean scores than those teachers who did not hold such positions. Significant _F_ ratios were obtained on the subscale, I_4, and the total scale, I_5.

Discussion. Although only two of the five tests of differences supported the sub-hypothesis 9.3, these results appear to substantiate in part the theoretical position set forth in Chapter II and the research evidence reported in Chapter III (_supra_, p. 60).

On the basis of significant results on I_4 and I_5 and the pattern evident concerning the mean innovativeness ratio, it would appear that the participant group are more innovative than the non-participant group. It is possible that the members are more innovative because they are closer to the communication channels which transmit new ideas. Perhaps the members as leaders of the teachers' professional organization also perceive certain expectations concerning innovativeness to be concomitant with the offices they represent.

It is noteworthy that Young's conclusions (_supra_, p. 56) appear to be supported, at least partly, by the findings of the sub-hypotheses 9.1, 9.2, and 9.3. In going from 9.1 to 9.3 the degree of teacher involvement in professional activities probably increased and it is noted that the number of significant differences found on the scales also increased. This trend appears to confirm Young's position (_supra_, p. 59).

IV. PROFESSIONAL TEACHER ATTITUDES AND INSTRUCTIONAL INNOVATIVENESS

Another measure of professionalism used in the present study was professional attitudes. The professional attitudes of teachers were measured by the Education Profession Attitude Questionnaire developed by Ratsoy and modified for the present study.

Hypothesis 10: Junior high school teachers classified by high or low professional attitude scores differ significantly in instructional innovativeness.

Findings. The results of tests of differences between teachers whose professional attitude score was low (thirty-seven and below) and teachers whose professional attitude score was high (above thirty-seven) are presented in Table XXXII. A significant F ratio was obtained on two scales, I_4 and I_5. The sub-scale I_4 consists of innovations focusing on the individualization of instruction. I_5, the Total Adoption Scale, contains instructional innovations which comprise the four sub-scales.

The data in Table XXXII indicate that teachers with high professional attitude scores scored higher on three of the sub-scales and on the Total Adoption Scale than did the group of teachers placed in the low professional attitude score category. On sub-scale I_2 the two groups of teachers had identical mean innovativeness ratios.

TABLE XXXII

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY PROFESSIONAL ATTITUDES

Professional Attitude Score	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Low (37 and less)	140	.36	.49	.42	.35	.39
High (more than 37)	186	.41	.49	.45	.41	.44
t		1.68	0.00	0.87	2.38	2.36
Significance		NS	NS	NS	.02	.02

The data in Table XXXIII indicates that the distribution of professional teacher attitude scores tended to be normally distributed. These scores ranged from twenty to fifty. The mean was 38.26. It was on the basis of this mean that teachers were classified into either low or high attitude categories.

Discussion. The finding of a positive relationship between professional attitude scores and innovativeness appears to be consistent with similar evidence found by Marion (supra, pp. 62-63). The results in the present study might be explained in the following manner. According to Ingram (supra, p. 60) the attitudes of the professional staff towards the teachers' organization will determine in large measure their attitudes to innovation. In other words, if a teacher's professional attitudes are in agreement with the policies of the teachers' organization then that teacher may tend to be more receptive to innovation.

V. COSMOPOLITENESS AND INSTRUCTIONAL INNOVATIVENESS

Hypothesis 11 states that junior high school teachers classified by cosmopolitan or local orientation differ significantly in instructional innovativeness. Teachers who were members of subject associations were classified as cosmopolitans and non-members were placed in the category referred to as locals.

Hypothesis 11: Junior high school teachers classified by
cosmopolitan or local orientation differ

TABLE XXXIII

DISTRIBUTION OF PROFESSIONAL ATTITUDE SCORES

(N = 326)

Scores	f
48 - 50	4
45 - 47	14
42 - 44	55
39 - 41	80
36 - 38	97
33 - 35	52
30 - 32	17
27 - 29	6
24 - 26	0
21 - 23	0
18 - 20	1

$\bar{x} = 38.26$ S.D. = 4.08

Theoretical Limits: 10 - 50

significantly in instructional innovativeness.

Findings. Table XXXIV presents the mean scores of teachers classified according to cosmopolitan or local orientation. Two of the tests, namely on I_3 and I_5, show F ratios significant beyond the .01 level. The test on I_4 is significant at the .001 level.

Discussion. Examination of Table XXXIV reveals that the mean innovativeness ratios of the cosmopolitans, that is, the subject association members, were decidedly higher than the mean innovativeness ratios of the locals or non-members on the three scales with significant differences. On only one sub-scale (I_2) was the mean score of the locals higher than that of the cosmopolitans.

A majority of the scale scores appeared to support this hypothesis and in addition on the three scales which discriminated there was a positive relationship between cosmopoliteness and instructional innovativeness. This appears to confirm previous findings by Carlson, and also the more recent evidence found by Marion (supra, p. 66).

VI. STEPWISE REGRESSION ANALYSIS

The final phase of the empirical analysis in the present study employed a stepwise regression procedure to determine relationships between the dependent variable, instructional innovativeness, and the personal, situational and professional factors or independent variables.

TABLE XXXIV

BASIC DATA FOR THE TESTS OF DIFFERENCES IN INSTRUCTIONAL INNOVATIVENESS BETWEEN TEACHERS CLASSIFIED BY COSMOPOLITAN OR LOCAL ORIENTATION

Social System Orientation	N	I_1 Mean	I_2 Mean	I_3 Mean	I_4 Mean	I_5 Mean
Cosmopolitans (Subject association members)	68	.39	.47	.53	.48	.47
Locals (Non-members)	258	.39	.50	.41	.36	.41
t		0.17	0.72	2.58	3.74	2.62
Significance		NS	NS	.01	.001	.01

The major purpose of these analyses was to determine which independent variables accounted for the maximum amount of variation in instructional innovativeness as measured by the sub-scales and the Total Adoption Scale.

Findings. Tables XLII to XLVI included in Appendix G summarize the findings of the five regression analyses performed for each of the five innovativeness ratios and all the independent variables. Variables were discarded if their inclusion in the regression analysis failed to contribute a significant increment to the explained variance. Only "t" values higher than necessary for significance as predictors at the .05 level in multiple regression were retained.

As is indicated by Table XLV, at most only 11.64 per cent of the variation in I_4 was accounted for by six of the independent variables. Less fruitful results were obtained on the other analyses. Cosmopoliteness and type of school appeared in three of the five regression analyses.

Discussion. The conclusion drawn from these analyses is that neither of the predictors used in the five step-wise regression analyses appeared to account for any appreciable per cent of the variation in instructional innovativeness in the present study. Needless to say, these results are contrary to all expectations. The results are surprising when compared to results reported

by Carlson (supra, p. 19), Marion (4, pp. 176-180), Hemphill (2, p. 103), and Holdaway (3, pp. 84-87). Nevertheless, the results of the present study are not uncommon. To illustrate, Rogers has summarized past attempts to account for variance and presents references to studies in which only 17 per cent of the variance was accounted for by the independent variables (5, pp. 287-292).

The results of the present study might be accounted for by several plausible explanations. Firstly, the present study was a cross-sectional study involving teachers from twenty-two schools representing five school divisions. The sample was heterogeneous since it included teachers representing a variety of subject areas. On the other hand, a previous study such as that reported by Marion focused on elementary principals in one school division (4, pp. 114-116).

Another factor which might account for the present results is the sample size. The present sample included 326 teachers. Carlson's sample of superintendents, however, only included 61 superintendents in the Allegheny County study and 46 superintendents in the West Virginia study (1, p. 13). Similarly Marion's sample included only 36 principals. The larger sample size of the present study suggests a possibility for a greater range of sources of variation.

The lack of success using regression analysis in

the present study might also be explained by the independent variables themselves. Perhaps appropriate variables were not chosen to predict innovativeness. To illustrate, Rogers reports one study where a relatively larger amount of variation as compared with previous studies was obtained by regression analysis mainly because of the inclusion of a previously unused variable (5, p. 291).

VII. SUMMARY AND CONCLUSIONS

Table XXXV summarizes the findings related to Hypotheses 7 to 11. Hypothesis 7 was substantially supported on three of the five adoption scales. That is, junior high school teachers with 3-5 years of post-secondary education differed significantly from the 6 or more years group on Instructional Aids (I_1), Instructional Planning and Organizing Practices (I_3), and the Total Adoption Scale (I_5). The 3-5 group also differed significantly from the teacher group having 2 and fewer years on I_1. There was no difference between the groups on Technical and Professional Assistants (I_2), and Individualizing Instruction (I_4).

Hypothesis 8 was tentatively rejected on the grounds of insufficient evidence. Significant differences between categories of recency of in-service education were found only on I_1, that is, Instructional Aids.

Sub-hypothesis 9.1 was tentatively rejected. None

TABLE XXXV

SIGNIFICANCE OF *F* RATIOS RELATED TO HYPOTHESES BASED ON PROFESSIONAL FACTORS OF J.H.S. TEACHERS

Hypothesis	Adoption Sub-Scales I_1	I_2	I_3	I_4	Adoption Scale I_5	Number of Significant *F* ratios & Decisions
7 (Post-Sec. Ed.)	.05	NS	.05	NS	.05	3 Substantially Accepted
8 (Recency I.S.E.)	.01	NS	NS	NS	NS	1 Tentatively Rejected
9.1 (Meeting Attend.)	NS	NS	NS	NS	NS	0 Tentatively Rejected
9.2 (Division Assoc.)	NS	NS	NS	.05	NS	1 Tentatively Rejected
9.3 (Prov. Organ.)	NS	NS	NS	.01	.05	2 Partially Accepted
10 (Prof. Att.)	NS	NS	NS	.02	.02	2 Partially Accepted
11 (Cosmopoliteness)	NS	NS	.01	.001	.01	3 Substantially Accepted
Total Significant *F* ratio by Scales	2	0	2	4	4	

of the four adoption sub-scales or the Total Adoption Scale showed significant F ratios.

Sub-hypothesis 9.2 was tentatively rejected as inconclusive. Significant differences were only found on the Individualizing Instruction sub-scale, I_4. In this case the group of teachers who participated in divisional association activities had a significantly higher mean innovativeness ratio than the non-participants. In addition it was recognized that the participant group had higher mean innovativeness ratios on three of the sub-scales and the total scale.

Sub-hypothesis 9.3 was partially accepted. Significant differences were found on the sub-scale, Individualizing Instruction - I_4, and the Total Adoption Scale - I_5. In both cases the teachers who participated in provincial teachers' organization activities were significantly more innovative than the non-participating group.

Similarly in testing Hypothesis 10 significant differences in instructional innovativeness were found on I_4 and I_5. Hypothesis 10 was partially accepted. In both cases the group having high professional attitude scores was significantly more innovative than the group with low professional attitude scores. In addition it was noted that the teachers with high professional attitude scores had higher mean innovativeness ratios on four of the five scales in comparison with the teachers who had low

professional attitude scores.

Hypothesis 11 was substantially supported on two sub-scales and on the total scale with significant differences resulting at the .01 level and beyond. In these three cases teachers classified as cosmopolitans had significantly higher mean innovativeness ratios on I_3, I_4 and I_5 than did those teachers classified as locals.

It would appear from the results of these analyses that some professional factors at least are related to instructional innovativeness as it is measured in this study. That is, on five hypotheses under investigation including one which consisted of three sub-hypotheses, two hypotheses were substantially supported, one hypothesis and one sub-hypothesis were partially accepted, and one hypothesis and two sub-hypotheses were tentatively rejected.

To provide an answer to the sub-problem posed in Chapter I, that is, which of the personal, situational and professional factors explain the greatest percentage of the variation in teachers' innovativeness ratios, five step-wise regression analyses were performed. It was concluded that none of the factors appeared to account for an appreciable percentage of the variation in the innovativeness ratios. However, it was pointed out that cosmopoliteness and type of school stand out as two variables most frequently accounting for variation in the innovativeness ratios.

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CHAPTER VIII

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Contained in this chapter is a review of the study. This includes a statement of the problem investigated, the methodology and instrumentation used, and a brief description of the sample. This chapter also contains the major conclusions with attendant implications.

I. SUMMARY OF THE STUDY

The Problem

The central problem of this study was to determine whether a relationship exists between the instructional innovativeness of junior high school teachers and certain characteristics of these teachers.

Rogers' adoption theory was employed to establish a theoretical base for the present study. In the light of this theoretical base and the research evidence reported in the review of literature eleven hypotheses were developed for testing. Hypotheses 1 to 6 postulated a relationship between instructional innovativeness and a selected set of teacher characteristics. These characteristics focused on personal and situational factors which influence adoption. These six hypotheses stated that junior high school teachers classified respectively by the

following personal and situational factors, namely, (1) sex, (2) marital status, (3) age, (4) total teaching experience, (5) type of school, and (6) school size, differ significantly in instructional innovativeness.

The second set of hypotheses, 7 to 11, were concerned with a second set of teacher characteristics, namely professional factors, which it was hypothesized are related to the teacher's adoption of instructional innovations. These five hypotheses including three sub-hypotheses stated that junior high school teachers classified respectively by the following professional factors, (7) years of post-secondary education, (8) recency of in-service education, (9.1) frequency of attendance at division association meetings, (9.2) participation or non-participation in divisional association activities, (9.3) participation or non-participation in provincial teachers' organization activities, (10) professional attitude score, and (11) cosmopolitan or local orientation, differ significantly in instructional innovativeness.

Instrumentation and Methodology

The major objective of the present study was to investigate whether a relationship exists between certain teacher characteristics and the instructional innovativeness of junior high school teachers. In order to attain this objective it was necessary to: (1) identify those

instructional ideas considered to be innovations and (2) develop an adoption scale which would measure instructional innovativeness.

To satisfy the first requirement an open-ended questionnaire containing 48 instructional ideas and practices was administered to 22 junior high school and elementary-junior high school principals in participating schools. The instructional innovations were identified using the following criteria: (1) an instructional innovation is defined as any new practice that can be adopted or used by the classroom teacher to improve instruction, and (2) the innovations should be of the type that the classroom teacher is free to adopt or reject without having to consider (a) administrative approval, and (b) major budgetary limitations.

To develop an adoption scale for measuring innovativeness 22 of the practices and ideas identified as instructional innovations were selected for the purpose. These composed four sub-scales and a total scale. The four sub-scales attempted to measure four specific types of instructional innovativeness, namely (1) Instructional Aids, (2) Technical and Professional Assistants, (3) Instructional Planning and Organizing Practices, and (4) Individualizing Instruction. The fifth scale, the Total Adoption Scale, which consisted of all 22 instructional innovations making up the sub-scale items constituted

a measure of instructional innovation of a general nature.

In addition to the adoption sub-scales and the Total Adoption Scale designed to measure instructional innovativeness, one section of the teacher questionnaire solicited information needed to classify teachers for hypotheses testing and another section measured the professional attitudes of teachers.

The data were collected by mailed questionnaire. Packages containing questionnaires with stamped self-addressed envelopes were forwarded to 22 principals who had consented to distribute, collect and return the teacher questionnaires.

After the data were collected the information from the questionnaires was coded, recorded and transferred to I.B.M. cards. Innovativeness ratios, namely I_1, I_2, I_3, I_4 and I_5, were calculated for each teacher from the four sub-scale and the Total Adoption Scale responses. These five innovativeness ratios constituted the dependent variables against which independent variables of the study were tested by means of _t_ tests and _F_ ratios.

The Sample

The sample of the present study consisted of junior high school teachers (grades VII, VIII and IX) teaching in elementary-junior high schools or junior high schools in metropolitan Winnipeg, Manitoba. Of the questionnaires

mailed to 418 junior high school teachers, 345 were returned of which 326 were usable. These 326, representing 80 per cent of the questionnaires, constituted the data which were used in hypothesis testing.

Results

In order to discover whether selected teacher characteristics, namely personal, situational and professional factors, were related to instructional innovativeness, hypotheses developed from Rogers' Adoption Theory and the review of the literature were tested. Results of tests of significance revealed the following:

Hypothesis 1, that teachers classified by sex differ significantly in instructional innovativeness, was partly supported by the findings of the present study. The personal factor, sex, was found to discriminate on two of the four sub-scales which measured specific types of instructional innovativeness. On the sub-scales I_1 and I_3 men were found to be significantly more innovative than women. However, no significant differences were found on the total scale.

Hypothesis 2, that teachers classified by marital status differ significantly in instructional innovativeness, was not supported. Marital status was found not to be a discriminating factor on any of the sub-scales or total scale measuring instructional innovativeness.

Hypothesis 3, that teachers classified by age differ significantly in instructional innovativeness, was substantially supported. The middle age group, 26-40 years, was found to be significantly more innovative than the oldest age group, 41 or more years, on two of the four sub-scales, I_1 and I_3, and also on the Total Adoption Scale, I_5.

Similarly, Hypothesis 4, that teachers classified by total teaching experience differ significantly in instructional innovativeness, was substantially supported on two of the four sub-scales and on the total scale. On I_1, I_3, and I_5 the teaching experience category 7-17 years was significantly more innovative than the group with 18 or more years of experience. In addition the 7-17 year experience category was found significantly more innovative on sub-scale I_1 than the age group with 6 and fewer years of experience.

Teachers classified by the type of school differed significantly in instructional innovativeness on sub-scales I_1 and I_4, and the Total Adoption Scale, I_5. In all three cases teachers teaching in junior high schools were significantly more innovative than teachers teaching in elementary-junior high schools. In two of the cases the _t_ tests were significant at the .001 level of confidence, and a third at the .05 level. Hypothesis 5 was supported.

Hypothesis 6, that teachers classified by school

size differ significantly in instructional innovativeness was tentatively rejected. Significant differences were found on only one sub-scale, I_4. In this case teachers from schools with 25 or more junior high staff members were significantly more innovative than teachers from schools having fewer than 25 junior high staff members.

Hypothesis 7, that teachers classified by the number of years of post-secondary education differ significantly in instructional innovativeness was supported. Two sub-scales, Instructional Aids (I_1) and Instructional Planning and Organizing Practices (I_3), and also the Total Adoption Scale (I_5) discriminated between two of the post-secondary education categories. In all three cases the teacher group with 3-5 years of post-secondary education scored higher mean innovativeness ratios than the teacher group with 6 or more years of post-secondary education. In addition the 3-5 year group scored significantly higher on innovativeness than the 2 and fewer years group on sub-scale I_1.

Only one of the five analyses performed in testing Hypothesis 8, that teachers classified by recency of in-service education differ significantly in instructional innovativeness, revealed differences between categories. On the basis of these results Hypothesis 8 was tentatively rejected.

Three sub-hypotheses, 9.1, 9.2 and 9.3, derived from the general hypothesis that instructional innovativeness

is related to participation in activities of a professional nature. Sub-hypothesis 9.1 that teachers classified by frequency of attendance at division association meetings differ significantly in instructional innovativeness was tentatively rejected. No significant differences were found on any of the five analyses. Sub-hypothesis 9.2 that teachers classified by participation or non-participation in divisional association activities differ significantly in instructional innovativeness was tentatively rejected. Significant differences were found only on the sub-scale Individualizing Instruction (I_4). Sub-hypothesis 9.3 that teachers classified by participation or non-participation in provincial teachers' organization activities was supported only in part. The participants group scored higher mean innovativeness ratios than did the non-participant group on Individualizing Instruction (I_4) and the Total Adoption Scale (I_5).

There was only partial support for Hypothesis 10 that teachers classified by high or low professional attitude scores differ significantly in instructional innovativeness. One sub-scale, Individualizing Instruction (I_4), and the Total Adoption Scale (I_5) revealed significant differences between the two categories. In each case the high professional attitude group scored higher mean innovativeness ratios than the low professional attitude group.

Finally Hypothesis 11 that teachers classified by cosmopolitan or local orientation differ significantly in instructional innovativeness was supported. On two of the sub-scales, Instructional Planning and Organizing Practices (I_3) and Individualizing Instruction (I_4), and on the Total Adoption Scale (I_5) the cosmopolitans (subject area members) were significantly more innovative than the locals (non-members).

In summary, evidence presented in this study for the eleven hypotheses under investigation indicates that five hypotheses were substantially supported, two hypotheses and one sub-hypothesis were partially supported, and three hypotheses and two sub-hypotheses were tentatively rejected. The study showed that there are significant differences in instructional innovativeness between teachers classified according to personal factors, according to situational factors and according to professional factors.

II. CONCLUSIONS

The conclusions presented here were arrived at on the basis of evidence from the present study. These conclusions, however, must be treated with caution. The generalizations are subject to several restrictions. For instance, any generalizations drawn are subject to the limitations of the instrument used to measure instructional

innovativeness. Some revision concerning regrouping of the items composing the instrument appears essential. Furthermore, the adoption scale and sub-scales need to be tested on other samples, perhaps, in other provinces. In addition to the limitation of the instrument there are further limitations concerning the sample compositions. Several of the categories employing discrete variables were of a small size. This factor adds another restriction to any broad generalizations. However, not withstanding these restrictions, the evidence in the present study supports many of the findings reported in previous research dealing with innovation.

Rogers' Adoption Theory appears to have provided a suitable model for guiding the investigation. There is some indication from the evidence of the present study that the individual's characteristics, in this case personal, situational and professional factors, are related to instructional innovativeness. Such personal factors as age and length of teaching experience appear to be related to adoption of specific types of instructional innovations. A situational factor such as the type of school in which the teacher works also appears related to innovativeness. Professional factors such as the amount of post-secondary education and cosmopoliteness appear to be associated with the adoption of specific types of instructional innovations. These factors also appear to be related to a

general type of instructional innovativeness. In the present study such factors as sex, membership in provincial teachers' organization executive or committees and high professional attitude scores also appear to suggest a possible relationship with instructional innovativeness.

On the basis of the results, there is some evidence to suggest that in the present sample the following appear to hold true for specific types of instructional innovativeness:

1. The typical innovative junior high school teacher who adopts Instructional Aids tends to be a male, 26-40 years of age, with 7-17 years of total teaching experience; he tends to teach in a school classified as a junior high school. In addition he has likely participated in an in-service education program within the last three years.

2. The typical adopter of Instructional Planning and Organizing Practices tends to be a male junior high school teacher, 26-40 years of age, with 7 to 17 years of total teaching experience and 3-5 years of post-secondary education. The adopter of these innovations also tends to be a cosmopolitan (subject area association member).

3. The typical innovative teacher who adopts teaching practices of the Individualizing Instruction type appears to be a teacher who teaches in a junior high school as opposed to teaching in an elementary-junior high

school and the school has 25 or more junior high school staff members. He tends to be involved in professional activities at the division association level and the provincial level; he is a cosmopolitan and his professional attitudes are highly congruent with the policies of the provincial teachers' organization.

With reference to instructional innovativeness of a general nature, the typical innovative teacher appears to have the following characteristics: He tends to be between 26 and 40 years of age with total teaching experience in the 7-17 year category. Furthermore this individual tends to teach in a school where only junior high grades (VII, VIII and IX) are taught. His professional characteristics indicate that he tends to have 3-5 years of post-secondary training and participates in provincial teachers' organization activities. In addition he is a cosmopolitan with a high professional attitude score.

III. IMPLICATIONS

The findings of the present study appear to suggest several implications for school principals, school boards and professional teachers' organizations. They also suggest a need for further research.

Implications for School Principals

Since the administrator in a school is one of the key persons in the promotion of new ideas, developments,

and experiments, it is his responsibility to provide the type of leadership which will stimulate instructional innovation.

The findings of the present study suggest several implications for the principal or the instructional leader of the school. It appears that the principal should make his teaching staff aware that certain innovations are available or desirable for them to use. Furthermore, the principal should ensure his staff is made aware that the use of new practices requires a certain degree of knowledge on the part of the teacher concerning the application and operation of these innovations. Finally, as instructional leader, the principal might provide a program to train teachers in the use and operation of innovations.

The findings of the present study suggest the following recommendation. It would appear that principals ought to encourage junior high teachers to become members of subject associations in order to stimulate the instructional innovativeness of these teachers. Some of the following suggestions might also be considered by principals:

1. Cultivation of an ideology of change in the school.
2. Innovation in the staff orientation program.
3. Establishment of a structure which will cause teachers to search for innovations and adopt them.

Implications for School Boards

The findings and conclusions of this study have practical implications for school boards as well. School boards as educational planners might consider the consequences of different organizational patterns on instructional innovativeness. The evidence in this study indicates that situational factors such as type of school are related to teachers' adoption of instructional innovativeness. This appears to suggest that school boards might consider providing types of schools which will stimulate instructional innovativeness.

In addition school boards might also consider providing teachers with opportunities to stimulate innovativeness through such mechanisms as sabbatical leave, release time and exchange of personnel.

Implications for Teachers' Professional Organizations

A number of the relationships in the evidence suggested possible implications for teachers' professional organizations.

The apparent positive relationship between cosmopoliteness and instructional innovativeness of teachers would seem to have implications for those concerned with professional development programs, especially the teachers' professional organization. During periods of rapid educational change the teachers' professional organization

might consider assisting subject associations to recruit a larger membership and thereby increase teacher involvement and participation in order to increase the instructional innovativeness of the teaching profession.

Implication for Further Research

The findings of the present study have shown that certain characteristics of teachers appear to be related to instructional innovativeness. The evidence of the present study also indicates a need for further research. This additional research might investigate the relationship between teacher characteristics and instructional innovativeness of teachers at other levels such as elementary or secondary school. It is suggested that perhaps further research might deal with teachers in specific subject areas.

The development of the Total Adoption Scale--an instrument that appears to discriminate meaningfully between different categories of teachers--opens a vast area of research, namely the classroom teacher and instructional innovativeness. According to numerous writers this area has been relatively untapped (supra, p. 4). This also indicates that further research along the lines of this study needs to be undertaken in other Canadian provinces. Perhaps replications of this study could be undertaken in rural school districts. Replications of this

study with improvements in the instruments and techniques might provide information of value to school administrators.

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APPENDIX A

INTRODUCTORY LETTER AND SUPERINTENDENT QUESTIONNAIRE

Department of Educational Administration
University of Alberta
Edmonton, Alberta

March 8, 1967.

Dear Sir:

First allow me to introduce myself and my research project. I am a Manitoban presently enrolled in a Master of Education program in the Department of Educational Administration at the University of Alberta.

The research study I am undertaking attempts to determine whether a relationship exists between certain teacher characteristics and teacher adoption of innovations.

Educators and educational institutions are under increasing pressure to introduce new ideas into educational practice. Research reported by Columbia University suggests that schools are slow to adopt new practices. Much of this research indicates that it has taken about fifty years from the time an idea is first introduced until it becomes common practice. Recent evidence indicates that teachers, schools and school systems are accelerating their rate of adoption of new ideas and practices. However, more understanding of this process is needed.

The study I plan to undertake may provide educational administrators with deeper understanding of the change process and the part played by innovators, adopters and rejectors in implementing new educational practices.

In previous studies of innovation, the unit of analysis has been the school system, the principal or the superintendent. Little is known about the role played by the teacher. The proposed study will explore this latter area. The focus will be on the teacher, in particular the junior high teacher, and the part he plays in effecting change at this level.

March 8, 1967

The method of data collection will be by questionnaire. Questionnaires will be answered anonymously by teachers, that is, teachers will not be asked to identify themselves on the questionnaires.

It is anticipated that it should take a teacher in the neighborhood of one-half to one hour to complete the questionnaire. The questionnaire will request information concerning such teacher characteristics as experience, age range, academic and professional education, teacher organization participation, teacher organization attitudes and professional growth. Another section of the questionnaire will request information about the adoption of such educational practices as use of consultant services, use of audio-visual aids, use of team teaching, etc.

In order that this study be completed, your co-operation is needed in gathering some preliminary data.

Please complete and return the attached questionnaire at your earliest convenience. Your co-operation is requested and will be much appreciated.

Thank you.

Yours truly,

MPY/sp

Michael P. Yakimishyn

Superintendent Questionnaire

1. May I have your permission to approach the principals in your school division in order to obtain their co-operation to carry out the proposed study?
   Yes ______ No ______

2. Please complete the following questionnaire regarding junior high schools in your school division.

   Note: In addition to the schools listed please add others which may have been omitted but where junior high classes are taught.

Name of School Where Junior High is Taught	Name of Principal	Address of School	(Check One Only) Grades Taught			
			VII-IX	I-IX	VII-XII	I-XII

APPENDIX B

INTRODUCTORY LETTER, IDENTIFICATION OF INSTRUCTIONAL INNOVATIONS QUESTIONNIARE, AND FOLLOW-UP LETTER

Department of Educational Administration
University of Alberta
Edmonton, Alberta

April 22, 1967

Dear Sir:

First allow me to introduce myself. I am a Manitoban presently enrolled in a Master of Education program at the University of Alberta. A major requirement in this program is the completion of a research project. The study I propose to carry out requires the co-operation of Manitoba principals and teachers. Therefore, I am writing to ask for your co-operation and permission to contact teachers in your school.

Preliminary arrangements involving clearance with the superintendent's office have been completed. The next phase of the study requires your assistance and co-operation. I will be most grateful for your assistance.

Very briefly, the study I am undertaking focuses on the innovativeness of teachers. The method of data collection will be by questionnaire. These are to be answered anonymously by teachers, that is, teachers will not be asked to identify themselves on the questionnaire. The information in these questionnaires will be analyzed to determine whether teachers with certain characteristics tend to be more or less innovative than teachers with other characteristics. None of the analysis will involve comparisons between individual teachers, schools or school systems.

It is anticipated that it should take a teacher in the neighborhood of one-half to one hour to complete the questionnaire. The questionnaires will be mailed about May 15th. These will request information concerning such teacher characteristics as experience, age range, academic and professional education, teacher organization attitudes and professional growth. Another section of the questionnaire will request information about the adoption of

April 22, 1967

certain instructional innovations.

In order that this study be completed, your co-operation is needed in gathering some preliminary data. Please complete and return the attached questionnaires at your earliest convenience. Your co-operation is requested and will be much appreciated.

Thank you.

Yours truly,

MPY/sp

Michael P. Yakimishyn

Principal Questionnaire

1. May I have your permission to approach the junior high teachers (grades VII to IX) in your school and will you assist me in this study by distributing the questionnaires and self-addressed envelopes to these teachers?
   Yes ______ No ______

2. If the response to question 1 is "yes" please complete the remainder of this questionnaire and the questionnaire below: (In either case please return these at your earliest convenience).

3. How many junior high school teachers are on staff in your school? ______

Questionnaire to Identify Instructional Innovations

The purpose of this questionnaire is to identify instructional innovations which classroom teachers are using or could be using to improve instruction in your school. This information will be used to construct the teacher questionnaire.

In identifying instructional innovations the following points should be considered:

1. An innovation, as defined for this survey, is any new practice that can be adopted or used by the classroom teacher to improve instruction.

2. It does not matter whether or not the practice is new as measured by the amount of time elapsed since first being used in education.

3. The innovation does not need to have been originated in your school or school system.

4. Innovations sought in this survey should be of the type that the classroom teacher is free to adopt or reject without having to consider:

   (a) administrative approval,
   (b) major budgetary limitations.

Taking into account these four considerations, which

Principal Questionnaire

of the following activities, practices, or teaching concepts:

(i) are available and/or used in your school?

(ii) do you consider to be instructional innovations?

Please respond to each of the items below by placing a check mark in either the "yes" or "no" column for each of the questions.

Activity, Practice or Teaching Concept	Available and/or used in your school?		Do you consider it an instructional innovation of the type defined?	
	Yes	No	Yes	No
1. Television receiver for classroom instruction				
2. SRA Reading Laboratory for improvement of student reading skills				
3. Classroom bulletin boards for instructional displays				
4. Filing system of indexed teaching aids, student materials, tests, and lesson plans, etc.				
5. Overhead projector for classroom instruction.				
6. Central office supervisors or consultants to provide consultative assistance to teachers.				
7. Movie projector for classroom instruction.				
8. Teacher use of comprehensive end-of-unit tests.				
9. Team teaching.				
10. Ability grouping within the classroom.				
11. Follow-up records of former students are maintained.				
12. Colored chalk for instructional emphasis.				

Activity, Practice or Teaching Concept	Avail. and /or used?		Innovation?	
	Yes	No	Yes	No
13. Student cumulative record cards for teacher use.				
14. Tape recorder to supplement instruction.				
15. Guidance counsellor to assist teachers with respect to student information.				
16. Differentiated assignments for different students within the same classroom.				

*Please remember the four considerations to be used in identifying instructional innovations for this study.

17. Programmed instructional aids for student self-study.				
18. Language laboratory for classroom instruction.				
19. School subject clubs such as science club, drama club, etc. established to complement instruction.				
20. Lay persons for classroom presentations.				
21. Newspapers for classroom instruction.				
22. Filmstrip projector to supplement classroom instruction.				
23. Mathematical models and aids for math instruction.				
24. Student book clubs such as Teen-Age Book Club (TAB)				
25. Student handbooks provided to orient students to instructional services.				

Activity, Practice or Teaching Concept	Avail. and /or used?		Innovation?	
	Yes	No	Yes	No
26. Paraprofessionals or non-professionals assist teachers in routine tasks.				
27. Field trips.				
28. Teacher's Daily Lesson Plan Book for organizing daily teaching plan.				
29. Photocopy machine for copying materials for classroom instruction.				
30. Classroom homework chart for recording instructional assignments				
31. Record player for classroom instruction.				
32. Teacher consideration of pupil self-concept in organizing learning experiences.				
*Please remember the four considerations to be used in identifying instructional innovations for this study.				
33. Radio receiver to complement classroom instruction.				
34. Globes and maps for classroom instruction.				
35. Duplicating equipment (Spirit Duplicator, Gestetner, etc.)				
36. Clerical personnel assist teachers in routine tasks.				
37. Equipment for making instructional transparencies.				
38. Regrouping students within the classroom to accommodate to their changing learning rates.				

Activity, Practice or Teaching Concept	Avail. and /or used?		Innovations?	
	Yes	No	Yes	No
39. Opaque projector to make enlargements for classroom instruction.				
40. Science charts for classroom instruction.				
41. Provision for individual students to pursue projects of their own choosing.				
42. Resource units prepared for classroom instruction.				
43. The discovery or inquiry method for classroom instruction.				
44. Provision for students to work in small groups.				
45. Test items, summaries, etc., are recorded by teacher on sets of index cards.				
46. Provision for teacher initiated conferences between teacher, student and parents.				
47. Provision for pupils to have opportunities for a continuing counselling relationship with one teacher.				
48. Paperback editions of books as supplementary material.				

In addition to the activities, practices or teaching concepts listed, please add others which have not been listed in this questionnaire but which:

(i) are available and/or used in your school; and
(ii) meet the four considerations previously mentioned.

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Department of Educational Administration
University of Alberta
Edmonton, Alberta

May 10, 1967

Dear Principal:

Some time ago I contacted a number of Manitoba school principals about granting me permission to approach junior high school teachers in their schools in relation to a study I am doing. Your school was among those contacted. To date I have not received a reply from you.

If you sent your reply in the past few days, I thank you for it and please disregard the rest of this letter. On the other hand, you may have mislaid the questionnaire, or did not receive the one I sent. I have therefore included another.

It will probably take you no more than 10 minutes to complete. Please do it now and drop it in the mail. Your assistance will be greatly appreciated.

A copy of the abstract of the thesis will be sent to all participating schools.

Yours truly,

Michael P. Yakimishyn

P.S. The time involved in completing the teachers' questionnaire has been revised downward considerably. It should take most teachers no longer than 10 minutes to complete it.

APPENDIX C

LETTER OF INSTRUCTIONS TO PRINCIPALS

Department of Educational Administration
University of Alberta
Edmonton, Alberta

May 10, 1967

Dear Principal:

Thank you for permitting me to contact teachers in your school and for agreeing to assist me in my study.

Very briefly, I will describe the assistance required. This package contains self-addressed envelopes containing a cover letter and questionnaire for each junior high school teacher (see attached copy). Please carry out the following with respect to each envelope and its contents:

1. Please distribute one self-addressed envelope with contents to each junior high school teacher in your school. Do not include the principal and vice-principals in this survey.
2. Please collect the sealed self-addressed envelopes containing questionnaires and return these to me as soon as possible.

Suggestion

It should take teachers no more than 5 to 10 minutes to complete the entire questionnaire. I am hoping that this factor will produce 100 per cent returns. The percentage of questionnaires returned is important in this study. As a result I will need the assistance of most of the teachers in the participating schools.

I would therefore appreciate very much your using a method of distribution and collection that would ensure maximum returns. Perhaps several minutes taken at a staff meeting, if this is feasible, would sufficiently attend to this matter.

Thank you again for your assistance with my study. I am most grateful for it.

Yours truly,

Michael P. Yakimishyn

P.S. A copy of the abstract of the thesis will be sent to all participating schools.

APPENDIX D

INTRODUCTORY LETTER AND TEACHER QUESTIONNAIRE

Department of Educational Administration
University of Alberta
Edmonton, Alberta

May 10, 1967

Dear Teacher:

First allow me to introduce myself. I am a Manitoban presently enrolled in a Master of Education program at the University of Alberta. A major requirement in this program is the completion of a research project. The study I am undertaking requires the assistance and co-operation of Manitoba junior high school teachers. I am writing to ask for your co-operation in answering the attached questionnaire.

The questionnaire is to be answered anonymously, that is, you are asked not to identify yourself on the questionnaire. The study will involve comparisons between different categories of teachers. None of the analysis will involve comparisons between individual teachers, schools or school systems.

I earnestly solicit your co-operation in completing the enclosed questionnaire. After you have completed the questionnaire enclose it in the self-addressed envelope; seal the envelope and return it to your principal. It would be extremely helpful if this could be done as soon as possible. Your responses are assured complete anonymity; please do not sign the questionnaire.

May I express my sincere thanks in advance. I understand the demands that are made on your time and therefore am especially grateful for your co-operation.

Very sincerely yours,

Michael P. Yakimishyn

TEACHER QUESTIONNAIRE

PERSONAL BACKGROUND INFORMATION SECTION

Instructions: Please check (✓) the response to each item which provides the correct information about you. Place your response in the appropriate blank. Please respond to all items.

1. Sex
Male .... _____1
Female .... _____2

2. Marital Status
Single .... _____1
Married .... _____2
Other .... _____3

3. Age
Under 21 .... _____1
21 - 25.9 ...... _____2
26 - 30.9 ...... _____3
31 - 35.9 ...... _____4
36 - 40.9 ...... _____5
41 - 45.9 ...... _____6
46 - 50.9 ...... _____7
51 or more ..... _____8

4. Years of training (as per evaluation for salary).
Less than 1 year _____1
1.0 - 1.9 ...... _____2
2.0 - 2.9 ...... _____3
3.0 - 3.9 ...... _____4
4.0 - 4.9 ...... _____5
5.0 - 5.9 ...... _____6
6.0 - 6.9 ...... _____7
7.0 or more .... _____8

5. What is your total teaching experience including this year?
One year or less _____1
2 - 3 .... _____2
4 - 6 .... _____3
7 - 9 .... _____4
10 - 12 .... _____5
13 - 17 .... _____6
18 - 21 .... _____7
22 or more years _____8

6. What is the major area of specialization in which you are currently teaching?
Mathematics .... _____1
Social Studies . _____2
Science .... _____3
English .... _____4
French .... _____5
Ind.Arts, H.Ec., Phys. Ed. .... _____6
Guidance .... _____7
Vocational Ed. . _____8
Other or none (Specify)
.... _____9

7. What is your present position?
Teacher in Jr. high school grades .. _____1
Specialist not assigned to regular classroom (e.g. librarian, etc.) .... _____2
Other (Specify)
.... _____3

8. How would you classify your school according to grades taught?
I - IX .... _____1
VII - IX .... _____2
Other (Specify)
.... _____3

9. How many junior high teachers, including principal and vice-principal are on staff of school in which you are teaching?

1 - 4 .... _____1
5 - 9 .... _____2
10 - 14 .... _____3
15 - 19 .... _____4
20 - 24 .... _____5
25 - 34 .... _____6
35 or more ...... _____7

10. Are you a member of the Manitoba Teachers' Society?

Yes .... _____1
No .... _____2

11. Are you a member of the M.T.S. provincial Executive Council or of a provincial committee of the M.T.S.?

Yes .... _____1
No .... _____2

12. Are you an Executive member of your teachers' Local Division Association?

Yes .... _____1
No .... _____2

13. Are you a member of an M.T.S. subject area association?

Yes .... _____1
No .... _____2

14. How many meetings of the Division Association Local did you attend between Sept. 1, 1966 and May 15, 1967?

All of them .... _____1
Most of them ... _____2
Few of them .... _____3
None of them ... _____4

15. When was the last time that you took part in an in-service education project during the school year? (This refers to projects organized by the M.T.S., the school district, groups of teachers within a school or a group of schools).

This school year _____1
1965-1966 ...... _____2
1964-1965 ...... _____3
Prior to 1964-65 school year .... _____4
Have not participated ever ... _____5

TEACHER PRACTICES SECTION

Instructions:

1. (a) In the column on the left please check (✓) each of the following instructional aids which you have used at least twice between September 1, 1966 and May 15, 1967 for classroom instruction.
   (b) In the right hand column please check (✓) those instructional aids available in your school.

Items Used (check)	Instructional Aids	Items Available (check)
	television	
	overhead projector	
	movie projector	
	tape recorder	
	opaque projector	
	filmstrip or slide projector	
	record player	
	radio	
	programmed instructional aids (texts, teaching machines, etc.)	

Instructions:

2. (a) In the column on the left please check (✓) each of the following services which you have used at least twice between September 1, 1966 and May 15, 1967.
   (b) In the right hand column please check (✓) those services available in your school.

Services Used (check)	Services	Services Available (check)
	paraprofessionals or teacher aides	
	clerical personnel (typist, etc.)	
	consultants, subject supervisors	
	student guidance services	
	lay persons (outside speakers, etc.)	not appli.

Instructions:

3. (a) In the column on the left please check (✓) each of the following practices which you have used to assist your instructional planning between September 1, 1966 and May 15, 1967.
   (b) In the right hand column please check (✓) which of the first three items are available in your school.

Practice Used	Practice	Check if available
	equipment for making instructional transparencies (e.g. Diazo, Thermofax)	
	photocopying machine for copying instructional materials	
	resource units prepared for classroom instruction	
	Teacher's Daily Lesson Plan Book	Not appli.
	student cumulative records to assist in instructional planning	Not appli.
	filing system of indexed teaching aids, student materials, tests, etc.	Not appli.

Instructions:

4. Please check (✓) each of the following instructional practices which you have used quite regularly between September 1, 1966 and May 15, 1967.

Practice Used	Instructional Practice
	team teaching
	ability grouping within the classroom
	differentiated assignments for different students within the same classroom based on their special needs and interests
	regrouping of students within the classroom to accommodate to their different learning rates
	class organized in such a way that individuals and groups with different abilities can move ahead more rapidly or go more slowly than others
	provision was made for individual students to pursue projects of their own choosing
	provision was made for students to work in small groups
	discovery or inquiry method used for classroom instruction

ATTITUDE SECTION

Instructions: Please indicate the degree to which you personally agree or disagree with each of the statements below by checking (✓) the appropriate blank for each set of responses.

1. Schools should be granted greater local autonomy in curriculum building.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
2. Provincial teachers' associations should be able to discipline members for violating teacher ethics.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
3. The teaching profession should be represented on curriculum committees of the Department of Education or of local school systems.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
4. Provincial teachers' associations should have the right to recommend cancellation of a teacher's certificate.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
5. The curriculum authority of the Department of Education should be limited to matters of course objectives and minimum content.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
6. Selection of instructional methods should be the prerogative of teachers.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
7. All teachers should be employed and paid by the provincial government.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
8. Teachers should have the full rights of collective bargaining for determining their salaries and working conditions.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
9. Curriculum guides issued by the Department of Education should specify methods to be used.
   Agree strongly Agree Undecided Disagree Strongly disagree
   1 _____ 2 ___ 3 _____ 4 _____ 5 _____
10. Major responsibility for the certification of teachers should rest with the teaching profession.
    Agree strongly Agree Undecided Disagree Strongly disagree
    1 _____ 2 ___ 3 _____ 4 _____ 5 _____

APPENDIX E

INTERCORRELATION OF EIGHTEEN VARIABLES WITHIN THE SAMPLE

TABLE XXXVI

INTERCORRELATION[a] OF EIGHTEEN VARIABLES WITHIN THE SAMPLE (N 326)

Variable	1	2	3	4	5	6	7	8	9	Variable
1. Sex	1.000	---[f]	0.056	-0.012	0.023	---[f]	-0.011	---[f]	---[f]	1.
2. Marital status		1.000	.214[c]	.142[e]	.157[d]	---[f]	-.032	---[f]	---[f]	2.
3. Age			1.000	.350[c]	.869[c]	.003	.094	-0.170[d]	-0.018	3.
4. Post-sec. ed.				1.000	.271[c]	.110	.157[d]	-.171[d]	-.027	4.
5. Experience					1.000	.032	.051	-.161[d]	-.038	5.
6. Type of school						1.000	.273[c]	---[f]	---[f]	6.
7. Staff size							1.000	-.036	.074	7.
8. Prov. member								1.000	.077	8.
9. Local member									1.000	9.
10. Cosmopoliteness										10.
11. Meeting attend.										11.
12. In-service ed.										12.
13. I_1										13.
14. I_2										14.
15. I_3										15.
16. I_4										16.
17. I_5										17.
18. Prof. Attitude										18.

[a] Correlations are product-moment coefficients unless otherwise specified.

[b] Point biserial correlations.

[c] Significance at .001 level.

[d] Significance at .01 level.

[e] Significance at .05 level.

[f] Correlations of two dichotomous variables are not reported.

TABLE XXXVI (continued)

Variable	10	11	12	13	14	15	16	17	18	Variable
1. Sex	---[f]	0.195[c]	-0.085	-0.127[e]	0.033	-0.120[e]	0.000	-0.071	-0.136[e]	1.
2. M.Status	---[f]	-.012	-.059	-.027	.031	.016	.024	.017	.113[e]	2.
3. Age	-0.212[c]	-.130[e]	.045	-.068	.038	-.086	-.017	-.053	-.112	3.
4. P.S. Ed.	-.007	.139[e]	.069	.031	.088	-.055	-.029	.006	.065	4.
5. Exp.	-.168[d]	-.178[d]	-.007	.023	.030	-.009	.000	.007	-.049	5.
6. Type	---[f]	.127[e]	.035	.095	.071	.041	.161[d]	.159[d]	.052	6.
7. Size	-.030	.145[e]	.056	-.023	-.005	-.036	.105	.040	-.002	7.
8. Prov.Act.	---[f]	.099	.070	-.031	-.008	-.049	-.154[d]	-.120[e]	-.034	8.
9. Local Act.	---[f]	.282[c]	.066	-.005	.049	-.079	-.123[e]	-.083	-.104	9.
10. Cosmo.	1.000	.186[d]	.028	.009	.040	-.142[e]	-.204[c]	-.144[e]	-.028	10.
11. Meet.Att.		1.000	.134[e]	-.035	.038	-.087	-.021	-.036	-.124[e]	11.
12. I.S. Ed.			1.000	-.124[e]	.004	-.076	-.013	-.071	-.093	12.
13. I_1				1.000	.114	.277[c]	.219	.580[c]	.096	13.
14. I_2					1.000	.209[c]	.126	.467[c]	.007	14.
15. I_3						1.000	.265	.612[c]	.080	15.
16. I_4							1.000	.793[c]	.106	16.
17. I_5								1.000	.128[e]	17.
18. Prof. Att.									1.000	18.

[a] Correlations are product-moment coefficients unless otherwise specified.
[b] Point biserial correlations.
[c] Significance at .001 level.
[d] Significance at .01 level.
[e] Significance at .05 level.
[f] Correlations of two dichotomous variables are not reported.

APPENDIX F

INTERCORRELATION BETWEEN SUB-SCALE ITEMS AND INNOVATIVENESS RATIOS

TABLE XXXVII

INTERCORRELATION BETWEEN INSTRUCTIONAL AIDS SUB-SCALE ITEMS AND THE INNOVATIVENESS RATIOS I_1 AND I_5

Sub-scale Items	Number of Cases for Each Cell	Innovativeness ratio I_1	Innovativeness ratio I_5
1. Television	276	.633[a] (40 %)*	.391[a] (15.3%)*
2. Overhead projector	305	.590[a] (34.8%)*	.367[a] (13.6%)*
3. Tape recorder	326	.525[a] (27.6%)*	.168[b] (2.8%)*
4. Filmstrip or slide projector	326	.596[a] (35.5%)*	.439[a] (19.3%)*
5. Programmed instructional aids	67	.582[a] (33.9%)*	.463[a] (21.4%)*

[a] Indicates significance at the .001 level of confidence.

[b] Indicates significance at the .01 level of confidence.

*Percentages indicate relative predictability between scale items and scale scores.

TABLE XXVIII

INTERCORRELATION BETWEEN TECHNICAL AND PROFESSIONAL ASSISTANTS SUB-SCALE ITEMS AND THE INNOVATIVENESS RATIOS I_2 AND I_5

Sub-scale Items	Number of Cases for Each Cell	Innovativeness ratio I_2	Innovativeness ratio I_5
1. Paraprofessionals & teacher aides	57	.638^{a} (40.7%)*	.356^{b} (12.7%)*
2. Clerical personnel	324	.613^{a} (37.6%)*	.299^{b} (8.9%)*
3. Consultants or subject supervisors	172	.676^{a} (45.7%)*	.302^{b} (9.1%)*
4. Student guidance	318	.740^{a} (54.8%)*	.304^{a} (9.2%)*
5. Lay persons	326	.458^{a} (21 %)*	.304^{a} (9.2%)*

[a] Indicates significance at the .001 level of confidence.

[b] Indicates significance at the .01 level of confidence.

*Percentages indicate relative predictability between scale items and scale scores.

TABLE XXXIX

INTERCORRELATION BETWEEN INSTRUCTIONAL PLANNING AND ORGANIZING PRACTICES SUB-SCALE ITEMS AND THE INNOVATIVENESS RATIOS I_3 AND I_5

Sub-scale Items	Number of Cases for Each Cell	Innovativeness ratio I_3	Innovativeness ratio I_5
1. Equipment for making instructional transparencies	276	.673 (45.3%)*	.375 (14 %)*
2. Photocopying machine	301	.658 (43.3%)*	.395 (15.6%)*
3. Resource units	81	.608 (37 %)*	.499 (24.9%)*
4. Filing system of teaching aids	326	.634 (40.2%)*	.424 (18 %)*

All correlation coefficients are significant at the .001 level of confidence.

*Percentages indicate relative predictability between scale items and scale scores.

TABLE XL

INTERCORRELATION BETWEEN INDIVIDUALIZING INSTRUCTION SUB-SCALE ITEMS AND THE INNOVATIVENESS RATIOS I_4 AND I_5

(N — 326)

Sub-scale Items	Innovativeness ratio I_4	Innovativeness ratio I_5
1. Team teaching	.146[c] (2.1%)*	.329[a] (10.8%)*
2. Ability grouping within the classroom	.169[b] (2.9%)*	.536[a] (28.7%)*
3. Differentiated assignments	.172[b] (3 %)*	.505[a] (28.6%)*
4. Regrouping of students within the classroom	.172[b] (3 %)*	.535[a] (28.6%)*
5. Individuals and groups with different abilities can move ahead more rapidly or go more slowly than others	.046	.385[a] (14.8%)*
6. Provision for individual students to pursue projects of their own choosing	.106	.397[a] (15.8%)*
7. Provisions for students to work in small groups	.171[b] (2.9%)*	.450[a] (20.3%)*
8. Discovery or inquiry method	.194[a] (3.8%)*	.367[a] (13.5%)*

[a] Indicates significance at the .001 level of confidence.

[b] Indicates significance at the .01 level of confidence.

[c] Indicates significance at the .05 level of confidence.

*Percentages indicate relative predictability between scale items and scale scores.

APPENDIX G

REGRESSION ANALYSES

TABLE XLII

RESULTS OF REGRESSION ANALYSIS
DEPENDENT VARIABLE - I_1

(N = 326)

Order of entry in regression analysis	Variable name	Computed R	Cumulative per cent of variance accounted for by R
1	Recency of In-service education	.137	1.88
2	Sex	.196	3.83
3	Type of school	.230	5.33
4	Professional attitudes	.257	6.59
5	Teaching experience	.299	8.97
6	School size	.313	9.80

TABLE XLIII

RESULTS OF REGRESSION ANALYSIS DEPENDENT VARIABLE - I_2

(N = 326)

Order of entry in regression analysis	Variable name	Computed R	Cumulative per cent of variance accounted for by R
1	Post-secondary education	.113	1.29

TABLE XLIV

RESULTS OF REGRESSION ANALYSIS
DEPENDENT VARIABLE - I_3

(N = 326)

Order of entry in regression analysis	Variable name	Computed R	Cumulative per cent of variance accounted for by R
1	Professional attitudes	.145	2.11
2	Cosmopoliteness	.224	5.05
3	Teaching experience	.270	7.34
4	Sex	.283	8.06
5	Type of school	.290	8.54
6	School size	.307	9.46

TABLE XLV

RESULTS OF REGRESSION ANALYSIS DEPENDENT VARIABLE - I_4

(N = 326)

Order of entry in regression analysis	Variable name	Computed R	Cumulative per cent of variance accounted for by R
1	Cosmopoliteness	.204	4.17
2	Type of school	.284	8.08
3	Div. Assoc. activities	.302	9.13
4	Subject specialization	.316	10.16
5	Age	.331	11.01
6	Prov. Organ. activities	.341	11.64

TABLE XLVI

RESULTS OF REGRESSION ANALYSIS
DEPENDENT VARIABLE - I_5

(N = 326)

Order of entry in regression analysis	Variable name	Computed R	Cumulative per cent of variance accounted for by R
1	Teaching position	.127	1.63
2	Cosmopoliteness	.153	2.36
3	Meeting attendance	.183	3.35
4	Post-secondary education	.199	3.96

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